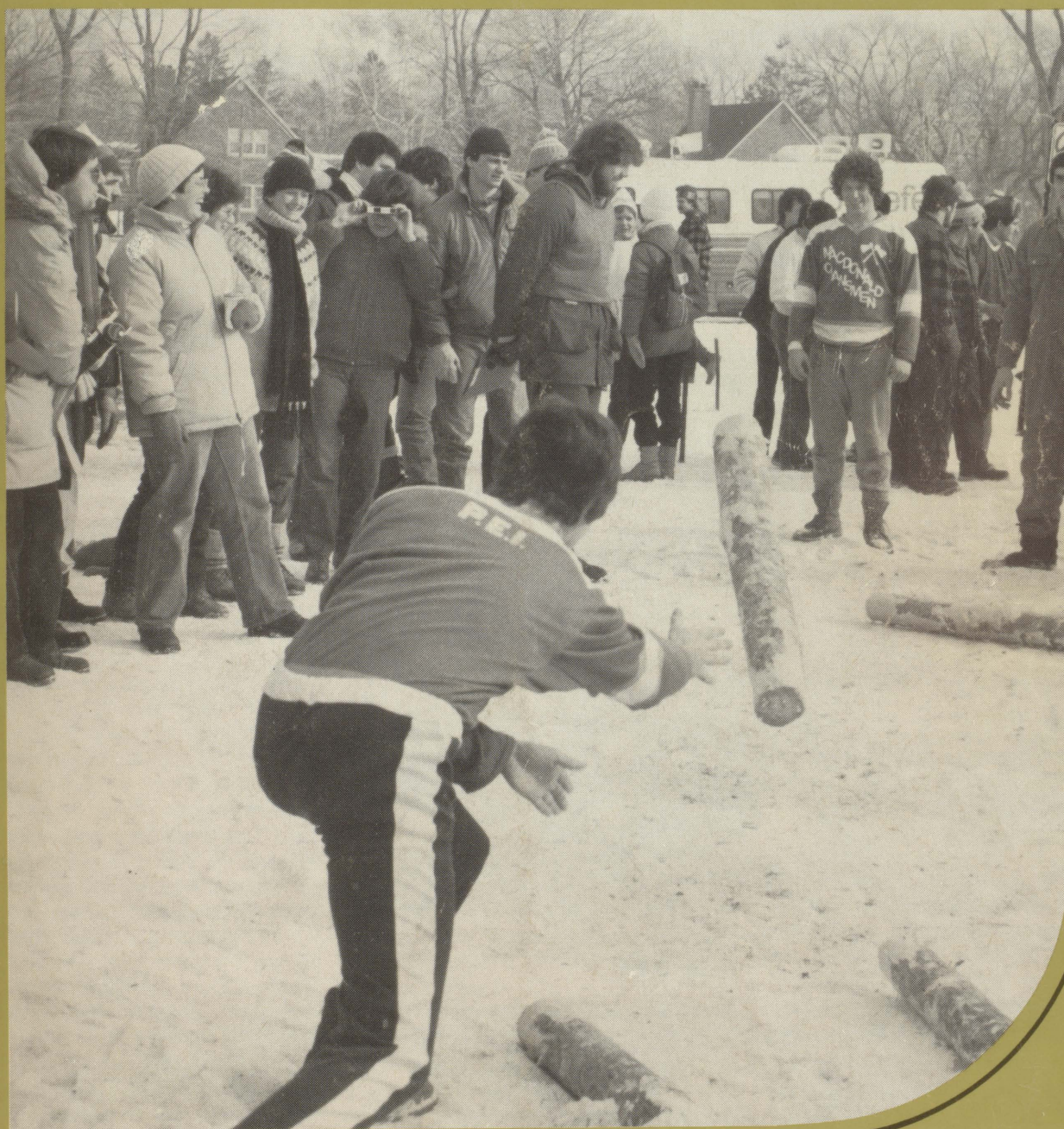
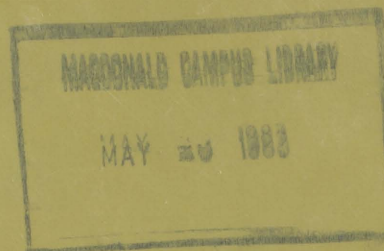


THE MACDONALD JOURNAL

MAY
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Macdonald is teaching and research; Macdonald is also people and in this issue, planned for the enjoyment of the general public, we attempt to introduce you to areas of particular interest to students and of general interest to all. For those near enough to visit us, we suggest you attend such popular student activities as the Woodsmen Competition and Macdonald Royal and Livestock Show. You may belong to the Arboretum and enjoy the benefits of being a member; you may tour the Farm and the Raptor Centre; you may purchase produce that is a by-product of some teaching and research efforts here and at Blair Farm. Our staff probably receives more requests for assistance than members of most other faculties. Would you phone the Faculty of Law and ask for legal advice? However, if time permits, some questions are answered and advice given. This is done by phone, by correspondence, in person and, most often, in the many Journal articles written by our staff. For those who cannot drop in for a visit, we think this a great way to get to know Macdonald and what we offer. In issues to come we will attempt to answer more questions and introduce you to more of our facilities.

THE MACDONALD FARM



Rudi Dallenbach
Director, Macdonald Farm

The Macdonald Farm is one of six farms which make up the Macdonald Research Station. The main purpose of the Farm is to supply facilities, land, materials, and opportunities for research and teaching. Some 250 hectares of prime land supply all the pastures and part of the grains for the livestock. A purebred dairy herd of some 70 Holsteins, 35 Ayrshires, 4 Jerseys, and all replacements are the pride and joy of herdsman Gordie Maclellan, a 1955 Macdonald Diploma graduate. Other livestock enterprises include 40 to 50 feeder steers as well as a flock of some 40 ewes and their lambs. A very productive 70 sow-to-finisher operation is in the care of herdsman Denis Hatcher, another Macdonald Diploma graduate ('70).

Over the past few years, the use of the Farm for teaching purposes, in particular, as well as for research has skyrocketed. The demand for teaching students the art of farm practice can hardly be met, and over 20 research projects are taking place all times. Newer, more modern facilities are currently in the planning stage. These facilities ensure that all students will have the opportunity to practice their profession in an appropriate environment.



Tours of the Farm attract bus loads of school children. For many of the youngsters, it is their first contact with a farm and farm animals.

The Farm also plays an important information and public relations role. Each year, many farm groups and some 3,000 weekend visitors enjoy visiting the Farm. A school visiting program operated annually by a group of 6 to 10 university students attracts some 25,000 school children of all ages. Visiting a working farm is a broadening experience no child should miss.

The benefits of this educational experience are manifold. The visitors, professionals or otherwise, derive considerable enjoyment from learning about animal care and food production in this unique setting. No amount of reading or classroom instruction can take the place of direct experience.

Another benefit is the image visitors have following their visit of farm-

ing and food production. They can more fully appreciate the complexities of agricultural production and the fact that farming is a scientific business requiring an ever-increasing degree of knowledge and a wide variety of skills. After such a visit they are in a much better position to fully appreciate the role of the farmer in a society which has become very urbanized.

(For further information on the Farm, on visits, and school tours, telephone 457-5315.)



What therapy! A day in the sunshine with friendly, informed guides, farm animals, and picnics.

Arboretum Gears Up for a New Season

by Professor A.R.C. Jones
Woodlands Section
Department of
Renewable Resources

The past winter of outdoor activities in the 540-acre Morgan Arboretum was somewhat down due to a disappointing surplus of rainfall over snowfall. Nevertheless hundreds of muffins and cups of hot drinks were served to many of the 2,400 members and their guests by the volunteer groups which manned the Conservation Centre, the A-frame, and the Chalet on week days and weekends. These volunteers also work to ensure that all users are members and make their contribution to support a community project in forest conservation. The low snowfall helped wood cutting operations to be carried out and permitted the harvest of old growth maple and crowded trees in two compartments. One was in the east grove sugar bush, last cut selectively in 1955-56, and the other in a mixed hardwood and hemlock forest to the west of centre road which was long overdue for a harvest cut. John Watson and his crew have produced over 200 face cords of firewood from these two operations with the aid of the Agri-Winch for skidding and a Forcom mechanical wood splitter. Once it has been properly seasoned, this wood will be sold to members in



The sap started running particularly early this year. John Watson, left, foreman of the Arboretum Association, keeps a watchful eye on the boiling.

August and September.

Besides membership income the sale of Arboretum products is the other major source of revenue that helps to protect and maintain this urban forest.

The early onset of spring this year necessitated the transfer of staff from wood cutting to sugaring with the first syrup produced on March 9th, one of the earliest dates on record. The educational sugar tours led by Volunteer interpreters began on March 14th with this group fully booked for tours. The members' sugar party was also held in March, and a sale of surplus plants and trees was held

from April 25th to May 7th.

Despite regular harvesting there are always some trees dying or blowdowns occurring which are time consuming for the work crew salvage. Hence a 'wood-pick-up' day is planned for Saturday, June 1st to allow members (only) to salvage some of these downed trees and contribute to their heating needs. A nominal fee will be charged so bring your chain saw but leave the five-ton truck at home!

(For information on membership in the Morgan Arboretum Association or concerning tours for children or adults, telephone 457-2000, ext. 250.)

BIRDS OF PREY...

...ON AN AGRICULTURAL RESEARCH CAMPUS?

Dr. David M. Bird
Director, Macdonald Raptor
Research Centre

Established in 1973, the Macdonald Raptor Research Centre (MRRC) with probably the world's largest colony of captive birds of prey in the world conducts a program of research, public awareness, and captive propagation of endangered species. Situated on about one acre of land, the facilities consist of several renovated poultry alters and newly constructed outdoor breeding pens. The MRRC is equipped with over 100 breeding pens for small falcons and, at present, 16 breeding chambers for large hawks and falcons. Some chambers are fitted with time clocks and artificial lighting to facilitate photoperiod studies. Each season, more than 500 falcon eggs are artificially incubated and up to 150 young falcons are hand-reared in our laboratory containing several forced-air incubators. The year-round staff consists of a director, an administrative assistant, a curator, and an assistant-curator but, during the summer, the staff is tripled to meet the heavy workload of the breeding season. Recently, we initiated a student intern program where housing is supplied in return for voluntary labour. Each student becomes heavily involved in the feeding and care of MRCC birds, conducts public tours, and is assigned to a specific project of his or her own. The colony is composed of roughly 300 American Kestrels (*Falco sparverius*) with the remaining 100 birds including small populations of European or Common Kestrels (*Falco tinnunculus*), Merlins (*Falcon columbarius*), Gyrfalcons (*Falco rusticolus*), two subspecies of Peregrine falcon (*anatum* and *tundrius*), and assorted hawks, owls, and eagles. Perhaps the greatest advantage that we enjoy as a raptor research centre is that we are located at an agricultural institution. A growing demand for captive-bred raptors for recreation, e.g., falconry, control of pest birds at airports, as well as research interests, necessitates the

removal of "green-thumb luck" in captive breeding programs. Thus, we are able to apply poultry science techniques to falcon breeding. Through extensive research over the last decade, we have developed and tested techniques for artificial insemination, artificial incubation, photoperiodic manipulation, hand-rearing, and forced reneesting. While these achievements hold obvious benefits for management of birds of prey in captivity, they, in turn, also facilitate more academic studies on the biology of raptors. The MRRC has basically concentrated its research efforts in several areas: management, nutrition, behaviour, hematology, toxicology, parasitology, genetics, and ecology.

Our first two major studies in raptor management were focused on artificial insemination and forced reneesting and, inevitably, these generated more questions than they answered. While artificial insemination, both cooperative and forced methods, is commonly used in private and institutional raptor breeding programs, techniques are now being sought to preserve falcon sperm cryogenically as is done with domestic animals. In 1982 we froze both peregrine and kestrel sperm with glycerol as the cryoprotective agent and were successful in obtaining live sperm after immediate thawing. Several lone female kestrels laying eggs were inseminated with the thawed samples. One egg was fertilized but, unfortunately, it failed to hatch. This research is continuing in 1983 in the form of a M.Sc. thesis project by Kelly Brock.

Another intriguing aspect of captive raptor management is the problem of obtaining poor hatches with full-term artificial incubation of falcon eggs. The poor hatchability of eggs artificially incubated from day one also appears to apply to kestrels. In an effort to improve the hatchability of eggs undergoing total artificial incubation, we experimented by subjecting eggs to two different relative humidities for the first week of incubation and then transferring them

to standard incubator practices for kestrel eggs. We concluded that full-term artificial incubation of kestrel eggs may provide the best results if the eggs are first exposed to one week of low relative humidity followed by incubation under standard conditions.

Hand-rearing is yet another practice commonly used today in raptor husbandry, but its ultimate effects on the quality of progeny remain to be fully understood. Studies on hand-rearing of kestrels in our laboratory have revealed significantly slower growth rates and smaller body weights at 24 days of age. These findings have led us to investigate the growth of nestling kestrels in relation to diet and feeding frequency; hence an M.Sc. study by André Lavigne is now underway.

The availability of large numbers of captive kestrels has facilitated several behavioural studies. In 1982 one-way glass windows were installed in three nestboxes to permit close observation of adult and nestling behaviour during incubation, hatching, and feeding. Such a study provides us with ample baseline data with which to formulate experimental research. A prime example of this latter approach is a cross-fostering study conducted over four years on American and European Kestrels. To summarize, we cross-fostered progeny of each species to the other at either day one or three weeks of age and either with siblings or alone. The following year, each bird was given a mate choice test between the two species. Approximately 50 per cent of the preferences were in favour of the foster parent type, suggesting a 50:50 risk involved with cross-fostering one raptor species to another.

During the last four years, MRRC personnel have concentrated on accumulating information on the hematology of birds of prey using the kestrel as a model. Recognizing the potential value of blood packed cell volume (PCV) as a diagnostic health aid, we showed that moult reproduction, exercise, air temperature, and body weight all affected PCV of fal-



Dr. David Bird, Director of the Macdonald Raptor Research Centre, holding a Red-Tailed Hawk named Miss Piggy. Photo courtesy John Mahoney Gazette.

cons. A method to measure simultaneously the concentration of progesterone, estrone, estradio-17B, and corticosterone in 0.4 ml of female American Kestrel plasma of varying lipid content has been developed by Nancy Rehder as part of her M.Sc. The potential benefits of these hormone studies, besides the obvious academic value, are the possibilities of inducing reproductive behaviour in raptor species or even in individual birds less inclined to breed in captivity. Secondly, knowledge of hormone levels during normal behavioural patterns will enable us to quantify abnormal behaviour resulting from stressful situations such as disease and poisoning by toxic substances.

With a large colony of breeding falcons at hand, toxicological research is a natural avenue to pursue. Under contract with the Canadian Wildlife Service, our kestrel colony has been used to explore the me-

chanism of DDE-induced eggshell thinning, the effect of PCB's and Mirex on spermatogenesis and secondary poisoning by the rodenticide, chlorphacinone. At present, we are engaged in studies to determine the effect of PCB's and Mirex on the male reproductive function in breeding kestrel pairs and, secondly, to investigate the effects of dietary sodium fluoride on nestling growth and reproductive performance of kestrel pairs.

In 1982 the McGill Institute of Parasitology developed a strong interest in the falcon colony. Their personnel were the first to successfully inoculate kestrels with *Trichinella pseudospiralis* and this has resulted in several studies in the planning stages for 1983, including experimental infection with *Giardia* spp. and the influence of parasite loads on adult reproductive performance and sibling competition.

In the area of genetics, the

pedigreed nature of the MRRC kestrel colony greatly facilitates the determination of the heritability of selected anatomical and reproductive traits in small falcons. Data accumulated over 10 years are now in the analytical stage. The obvious next step is to perform selective breeding experiments, including test crosses and back crosses.

The overall goal of such a captive colony must ultimately lead to some benefit for the species in its wild state. It is not our intention to domesticate the American Kestrel to the point where it can no longer be considered a wild species. Hence, it is necessary to look beyond the laboratory at the kestrel in its wild state. To this end, we have established a wild population of about 60 pairs of kestrels within a 15-mile radius of the MRRC simply by providing nestboxes in carefully selected locations. To date, completed studies of for-

esting and brood size manipula-
n have provided much data with
ich to compare the laboratory
strel with free-ranging birds. In
ms of aviculture, we have only to
k at the immense progress of the
ltry scientists to realize that the
cience" of breeding wild birds in
ctivity is not far off.

Some exciting developments have
ccurred in the continuing story of
endangered Peregrine Falcon and
orts to restore it to its former
ge. The Quebec government has
tatively agreed (pending the opin-
s of neighbouring provinces) to
w the release of progeny bred
n *tundrius* stock held at the Raptor
ntre. In 1982 four pairs of Pere-
ies bred at MRRC, producing a

total of 12 youngsters. An attempted
breeding took place in Montreal last
summer on a skyscraper located near
the port of Montreal. The pair was, un-
fortunately, interrupted by a Great
Horned Owl. Two females spent the
winter in Old Montreal, though, rais-
ing high hopes for any male
peregrines wandering through the
area.

Tours of the Centre's birds and
facilities continue to be very popular
with the public. School classes of all
ages, nature societies, and senior
citizen groups constitute the greatest
portion of visitors. To arrange for a
tour, one must make an appointment.
Fees are \$2 per adult over 18 and \$1
for children with a minimal require-
ment of \$10 per group to cover the

guide's wages. As of August 1, 1983,
a full-time interpretation officer will be
hired to develop further our educa-
tion/rehabilitation program. A year's
salary has been provided by a grant
from the Province of Quebec Society
for the Protection of Birds, Inc., and
for this we extend our heartfelt thanks
to the Society.

The good news outlined above is
threatened by stormy clouds,
however. Federal government grant
cutbacks will leave the Raptor Centre
short by about \$15,000 in the 1983-84
fiscal year. Any suggestions as to
how to raise this sum of money will be
welcomed.

(For more information on the Centre, please
call 457-2000, local 345.)

AIR FARM

NO QUICK FIX FOR MARGINAL FARMING

Professor A.R.C. Jones
Wetlands Section
Department of
Renewable Resources

Blair Farm is a 375-acre stretch
of marginal farmland, mixed wood-
lands, wetlands, and old pasture will-
ing to Macdonald College in 1973 by
late Roy J. Blair of Rockburn,
Quebec, with certain stipulations as
to the farm's use which included the
Monteauguay Valley Historical Socie-
ty. The home farm of 100 acres con-
sists of some category 4 to 7 class
agricultural land of which about 35
acres are cultivated to hay and grain
crops, 5 acres of new apple and pear
orchards, some small fruits
(strawberries and blackberries), sweet
potatoes and vegetable production, and
nearly 60 acres of poorly-drained
wetland, unimproved pasture, and
several small woodlots containing
mostly hardwoods and scattered
spruce. A north section of 240 acres
of second-growth woodlands is trav-
elled by a small brook with good
potential as a wildlife area and for
outdoor education purposes.

A 35-acre mature sugar bush and
syrup grove adjoins the farm to the west.
This grove is tapped each year for
syrup using vacuum pumping set up by
Albert Topaloff in 1982 and has a
potential of 4,000 taps. Currently
100 taps on tubing are installed and

a new sap storage house was built
last summer by Carole Trottier, the
Farm manager, and Claude Beauvais.
The sap is sold locally to two maple
operators. The farm also markets
syrup made by these producers.

In the fall of 1981, following the
departure of Dr. Phil Warman for
Nova Scotia Agricultural College
(NSAC), a new advisor was engaged
to work with the Macdonald College
Committee and the operator-man-
agers, Robert and Carole. Mr.
Winston (Wink) Keeler, an experi-
enced agronomist familiar with the region
and teaching at Ormstown, added ad-
ditional expertise to the direction of
the operation. Among other things, he
recommended some grain produc-
tion; so, this past summer, nearly 20
tons of oats and barley were produc-
ed and a new silo constructed to
store the crop. Another innovation
was Carole's purchase of several
goats and the commencement of a
small goat's milk and cheese opera-
tion. This adds to the other products
being sold at the farm, such as brown
eggs, corn and vegetables, bedding
and tomato plants in season from a
greenhouse attached to the barn,
small fruits, firewood, and maple
sap and syrup.

Since Macdonald took possession

in 1976 the land has been used for
student exercises of many kinds; for
trials of oats, barley, wheat, and corn;
for experiments on soil stoniness and
yield studies on class 3 lands; for
green manuring of corn; for effects of
sewage sludge on growth of hybrid
poplars and natural coppice; for com-
parisons of two sap tubing systems,
and for marked tree harvesting for
firewood of the overmature and
hazard trees in the sugar bush and
adjoining woodlands.

The farm presents a unique oppor-
tunity to demonstrate the skills, enter-
prise, and ingenuity required to
operate a marginal farm. The results
can help evaluate the needs and pro-
spects for a resource found common-
ly throughout eastern Canada. In
seven years Blair Farm has had four
successive operator-managers. De-
spite financial assistance from the
Dean's discretionary funds and the
hard work and dedication of these
young people, the enterprise has not
been easy as Roy Blair knew full well
when he bequeathed his estate for
the purpose of training rural youth for
this challenging task.

(For more information, telephone 514-264-5682.)

Planning Your Vegetable Garden

by Professor K.A. Stewart
Department of Plant Science

The first thing to do when you are planning your vegetable garden is to look for optimal location. Ideally, you want an area that has at least six to eight hours of sunlight a day and is far away from a hedge or any other material that is going to compete for nutrients or shade the garden. The garden should be, depending on the size of the family, anywhere from 3 by 3 feet to 10 x 30 feet. Figure 1 indicates the optimum size of a garden for a family of four. In general, the rows within your garden should be planted from east to west, and you should plant your garden so that the shortest plants are in the south and the tallest are in the north. An example of this would be: radish in the south, then lettuce, onions, on up to tomatoes, peppers and, finally, corn in the north. This arrangement will allow for the least amount of shading and, therefore, will optimize the light for each of the plants in the garden.

Prior to actually doing anything you should make a garden plan showing where you are going to put your rows, what plants you will be using, the spacings you will need and the time to plant (Tables 1 & 2). If the area chosen has never been used before, you are obviously going to have to take up grass and start with basic preparations. It is normal to dig a garden to about 8 to 10 inches deep. It should be well dug; if possible, use a rototiller. If you haven't got a rototiller, you should try to dig only the amount that you are going to use at any one time. If you work your ground in sections, it will not dry out as quickly.

Fresh manure may be added to the garden in the fall, but in the spring you must add rotted manure as fresh manure tends to rot the plants. Ideally, you should use cow or sheep manure. Add manure, compost if you have some and, if necessary, a chemical fertilizer. In general a standard 10-10-10 fertilizer applied at the rate indicated on the packet will do. You can also add bone meal, high in phosphorous, and lime. The lime may be necessary to increase pH to a

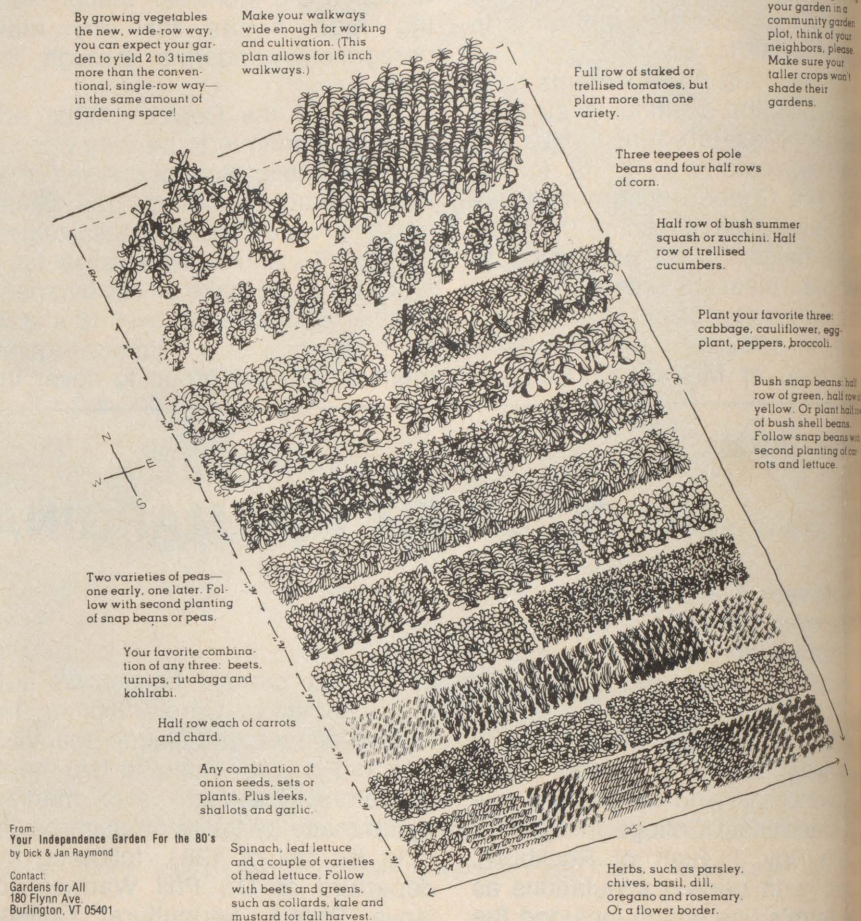


Figure 1.

level of 6.5, which is the best for most vegetable crops. To test the pH you could use litmus paper — which you can buy from most garden centres. This will indicate the current pH of your soil as well as how much lime is required to improve it.

After you have worked all this material into the soil, you will want to rake it to remove the rocks, level the soil and, finally, rake to prepare a good seed bed.

There are two distinct types of crops you want to plant: those which are transplanted such as tomato, pepper, eggplant, broccoli, and cauliflower, and those which are direct seeded such as onions, radish, and lettuce.

Transplants

Transplanted material may be

seedlings you started in the house — readers may wish to refer to the article by Bruce Coulman, "Starting Garden Plants Indoors" (Macdonald Journal, February 1983) — transplants bought from a garden centre. Transplants, generally, should be as wide as they are tall. They should have a thick stem, and should be a nice even green colour. Avoid a plant that is very long or is a very pale colour or has brown on the leaves. They probably not been grown under the best conditions, and you will obviously not get the best mature plant from it.

Before the plants are actually put into the garden they should be hardened off. This is a procedure whereby you take the plant from the optimum environment they've been in, i.e., the house or garden centre

Table 1. Vegetable planting guide

Vegetable	Amount to plant per person	Depth to plant seed	Space or thin plants in row	Distance between rows	Weeks to first harvest	Harvest lasts	Repeat planting 2-3 times	Plant in early or midsummer for fall harvest
EARLY HARDY VEGETABLES Sow as soon as ground can be worked in spring, 5-8 weeks before last frost.								
Leaf lettuce	1 pkt.	1/4"	6-8"	15"	6	6 weeks	Yes*	Yes
Onion sets	1 lb.	1/2"	3-4"	15-18"	14-26	**		
Peas	1/2 lb.	1 1/2"	1-3"	2-3'	9	9 weeks	Yes	
Spinach	1 pkt.	1/2"	4-6"	12"	7	to frost		Yes
MID-SEASON VEGETABLES Sow seed or set out seedlings 1-2 weeks before last frost.								
Beets	1 pkt.	1/2"	2-4"	12-18"	8	6 weeks	Yes	Yes
Broccoli	5-7 plants	+	15"	2-3'	10	to frost		Yes
Cabbage	5-7 plants	+	1 1/2'	2'	11	to frost		Yes
Head lettuce	8-10 plants	+	12"	15"	14	to late spring		
New Zealand Spinach	1/2 pkt.	1/2"	12"	2'	10	to frost	Yes	Yes
Onions	1/2 pkt.	+	3-4"	12-15"	14-26	**		
Radishes	1 pkt.	1/4"	1-3"	12"	3-5	1-2 weeks	Yes*	Yes
TENDER VEGETABLES Sow seed or set out seedlings at least 2 weeks after last frost.								
Beans	1/4 lb.	1-2"	4-6"	2-3'	8	to frost	Yes	
Cucumbers	1/2 pkt.	1/2"	12"	4-5'	7-8	5 weeks		
Eggplant	2-3 plants	+	2-3'	2-3'	10	to frost		
Melons	1/2 pkt.	1"	12"	5-6'	12-13	to frost		
Kraut	3-5 plants	1/2"	12"	3'	8	to frost		
Peppers	6-8 plants	+	1 1/2-2'	2-3'	9-10	to frost		
Summer squash	1/2 pkt.	1"	1 1/2-2'	3-4'	8	to frost		Yes
Sweet corn	1 oz.	1 1/2"	12"	3'	9-12	10 days	Yes	
Tomatoes	3-5 plants	+	2-3'	3'	7-12	to frost		

Don't sow in heat of summer + seedlings use thinnings, let remaining plants mature (till before first freeze) from Garden Ways "Joy of Gardening" by Dick Raymond.

and put them outside during the day and bring them back into the house at night. This will tend to acclimate the plants so there will be less stress when they are moved into the garden and, consequently, production time will not be slowed down. Normally, the period of hardening off takes about a week. Then the plants are ready to go into the garden.

Mulching

For most of your transplanted crops it would be best to consider mulching the soil. Mulching is important because it is going to reduce your weeding, which is something all gardeners like to avoid, and will tend to give you better water-holding capacity in the soil. Mulching is done at the time of transplanting, and it can be done in two ways. The first thing to decide is whether you want to use organic or inorganic material. The organic material could be straw. Do not use grass clippings as they tend to clump together when wet and are not that effective. I don't recommend them. An inorganic material could be newspapers — do not use the colour supplements — or plastic which is very easy to use. Take dark garbage

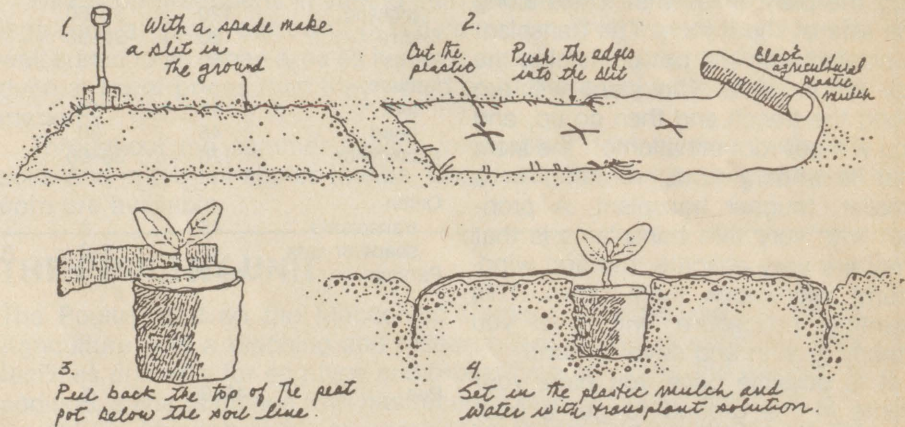


Figure 2. Use of plastic mulch. From Crockett's Victory Garden.

bags and slit them down the side or use commercially available plastic-mulch. If you are going to mulch with plastic, put the mulch down one to two days prior to transplanting. Take the edges of the plastic and bury them in the soil. Keep the plastic very tight. Then cut holes with correct spacings for your plants and transplant into the holes (Figure 2). Dark plastic will stop light from getting through and will cut down on weed growth. The important thing to remember with plastic is that when you water your garden it is best to

water into the soil area directly around the plants, not onto the plastic. Mulching will help prevent blossom end rot of tomatoes and peppers which is a very common problem in Quebec.

Planting Transplants

Dig a hole slightly larger than the container that has the plant in it. In the case of something like a compressed peat pot, rip down the top of the pot so that none of the pot ex-

tends above the soil level (Figure 2). This is important because if there is any of the peat pot extending above the soil, it will act as a wick to draw the water out of the soil, and you will be left with a plant that is always dry. With plants that have been started in plastic pots or yogurt containers, simply knock them out of the containers and plant them in the soil. Put some of the dirt back in the hole, put the plant in, extend the roots out so that they are nice and even, and add, if you wish, a transplanting solution. The most common one is 10-52-10 which is mixed with water and applied as a soluble solution. Prepare following the instructions on the packet and give roughly one half cup per plant. Then bring the soil up around the plant and firm it down well. If you are going to stake the plant, i.e., tomato, then put the stake in now. This will minimize root damage.

The above is normal procedure assuming your transplants are as wide as they are high. If you have got extremely tall transplants, i.e., greater than one foot tall, I would suggest digging a wide trench and putting the plant in so that it lies along the side of the trench. The transplant is planted with the pot containing the soil on its side. The plant will run along the trench and then go up, and you will get root initiation off the stem that is underground, resulting in a smaller, tougher transplant. A problem with very thin transplants is that they are very delicate; the first windstorm will knock them down. This planting procedure will give you steady growth and development.

It is possible once you have your plants in the ground to get a frost warning. On the night of the warning, take a heavy brown paper bag and put it over individual plants. This will give a certain amount of protection. Remove the bag in the morning and repeat the covering as necessary.

Direct Seeding

For plants that are direct seeded, such as lettuce, radish, carrots, simply follow the directions on the packet as to the depth of seeding required. I suggest you mark each row; this way you will not weed your plants or hoe the section because nothing has emerged. In the case of slow germinating seed, you can plant some

Table II. Planting guide for the home vegetable garden

Kinds	Distance apart		Amount of seed (g) or no. of plants per 15-m row	Depth to cover (cm)	Number of days seeding to harvest	How to use or store
	Rows (cms)	Plants in rows (cm)				
Asparagus	120-150	50	30	8	—	Fresh, frozen
Bean						Fresh, fresh
bush	60	5-8	115	4-5	52-70	frozen, canned
pole	60	20-30	115	4-5	65-75	pickled, dried
Beet	45-60	3-4	15	1.5	55-70	Fresh, pickled, canned, in cool cellar
Broccoli				Transplants		
early	75	45	0.5	1.5	60-80	Fresh, fresh frozen
late	75	45	0.5	1.5		
Cabbage				Transplants		
early	75	45	0.5	1.5	60-80	Fresh, raw
late	75	45	0.5	1.5	100-105	Fresh, raw, as kraut or in storage
Chinese Carrot	60	30	0.5	1.5	70-90	Fresh
	45-60	3-5	7	1.5	60-75	Fresh, raw, frozen, canned in cool cellar
Cauliflower	75	45	0.5	Transplants	60-80	Fresh, fresh frozen
Chard, Swiss	60	20-30	15	1.5	50-60	Fresh, fresh frozen
Citron melon	120-180	30-60	15	2.5	100-125	Preserved
Corn	75-90	30-45	50	2-5	70-100	Fresh, fresh frozen, canned
Cucumber						
slicing	120	30-60	3	1.5-	65-75	Raw
pickling	120	30-60	3	2.5	60-70	Pickled
Endive	60	20-30	0.5	1	70-90	Salad
Herbs	60	15	0.5	1	—	Fresh, dried
Lettuce						
leaf	45	15	0.5	1	40-50	Raw
head	45	30	0.5	1	70-75	Raw
Muskmelon	120	30-60	0.5	1.5	70-100	Fresh
Onion				Transplants		
transplants	45	8	0.5	seed 1.5	115-135	Raw, fresh, dried in dark, in cool storage
seeds or sets	45	5-8	700 g sets	sets 3	95	
Parsnip	45-90	5-10	7	1.5	120-150	Store in sand, moss, sawdust or leave in ground over winter
Pea	45-90	5	125	4-5	60-80	Fresh, fresh frozen, canned
Potato	75-90	25-30	50	10	90	Fresh, in cool storage
Pumpkin	180-250	90-120	30	2.5	110-130	Fresh, store dry
Radish, spring and fall crops	130	2	15	1	25-35	Fresh
Rhubarb	120	120	12	7	—	Fresh, fresh frozen
Rutabaga	60	15	15	1	110-130	Fresh, in cool storage
Spinach, spring and fall crops	45	10-15	15	2.5	40-45	Fresh, fresh frozen
Squash	180-250	90-120	30	3	90-115	Fresh, stored dry
Tomato						
staked	60	45-60	25-33	Transplants	100-130	Fresh, canned
unstaked	90	90	17	1	100-130	Fresh, canned
Turnip	45-60	8-10	15	1	50-70	Fresh
Watermelon	120-180	30-60	15	3	90-100	Fresh

From "Home Vegetable Growing," Agriculture Canada, Pub. 1059/E.

dish. This will mark your row, and you can harvest the radish before thinning the other crop.

For the correct spacing for both transplants and for direct seeding and the amount that is required for the person for both freezing and for consumption during the summer, see Table 1.

When to Plant

In the Montreal region the safest time for planting transplants, particularly delicate crops like tomato and pepper, is around the May 24 weekend. Check the weather reports for your area because these plants do not tolerate cold temperatures. You can actually get into your garden and start working in it at the end of April. The first things you will want to get in are peas and lettuce (Table 1). Check the charts or the seed packets; they will actually give you a good indication of what plants are going to want and when you should plant them.

Plant Protection

To protect crops you may want to start in early — lettuce and tomatoes — and to encourage fast growth, you can use small individual "hot" caps which are available from most garden centres. You put these waxed type paper caps over the plants at the time you transplant them. Open the leeward side of the cap. This acts basically as a greenhouse and will obviously encourage fast growth. As you need one per plant, hot caps are fine for a small garden, but in the case of a large area the cost becomes prohibitive. Corrugated clear fiberglass can be used for large areas. This is formed into a tunnel, leaving both ends open (Figure 3). This acts as an excellent protector. You can also get clear plastic and run it over a series of metal hoops. This works well but, unfortunately, unless the plastic is tight, it will tend to sag when it rains and will touch the plants and cause damage.

We hope these garden tips will help you to establish a vegetable garden that will give you pleasure both in the growing and consuming of your produce all summer long.

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Raymond Dick, Joy of Gardening, 384 p.

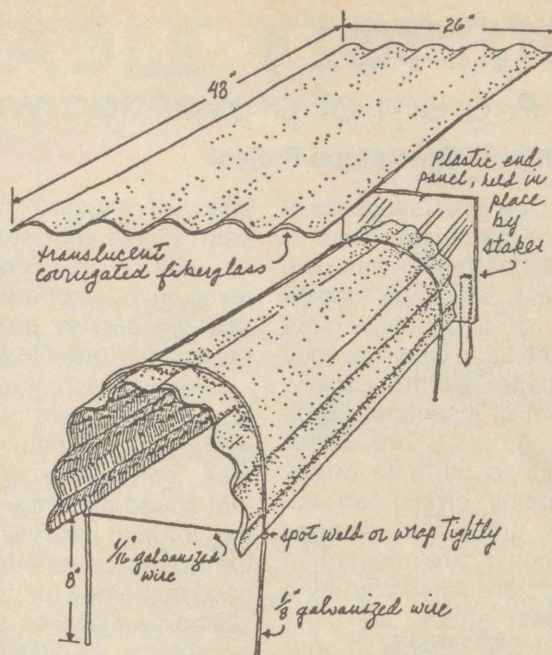


Figure 3. Corrugated Fiberglass Tunnels. From Crockett's Victory Garden.

HORTICULTURAL PRODUCE

Located on the Macdonald Campus in the Horticulture Research Area is the Horticultural Work Building. This building houses Campus Care, the fruit cold storage, fruit grading rooms, a field laboratory, and a small farm shop.

This shop first opens in July to start the strawberry season. The College runs a "pick your own" (PYO) operation. This type of operation is well suited to an urban area as it allows people to choose top quality produce at lower prices than they would pay for pre-picked material in the market.

Throughout the summer season vegetables from cultivar trials are sold. And in the fall apples (Melba, Courtland, and McIntosh) and sweet corn are available.

THE POULTRY UNIT

The Poultry Unit on the Macdonald Campus provides the Faculty of Agriculture with a teaching and research facility. It has cage and floor facilities primarily for egg-type and broiler-type chickens and turkeys. In addition, a line of guinea fowl has recently been acquired which Dr. S.P. Touchburn is using in his research. The Poultry Unit operates on the basis of support from the University for providing its teaching function, from research with respect to its research activity, and from the sale of products, both eggs and meat. All broilers and turkeys for meat are sent to a poultry processing plant. With respect to eggs, some are sent to Fedco but the majority of our eggs are marketed over the counter; the public are welcome to purchase fresh eggs on Fridays at the Macdonald Poultry Unit.

CALF RALLY

The 8th Annual Quebec Young Farmers' Calf Rally will be held at the Ormstown Fairgrounds, July 8-10th. The Calf Rally will include dairy, beef, and sheep showmanship classes. Judging competitions ranging from sire selection to hay classes will be featured Friday night. Both French and English calf clubs will be represented; about 200 participants are expected. Everyone is welcome to come and watch what promises to be a great animal show.

Garden Pests

A gram of prevention worth a kilogram of cure

by Staff, Ecological Agricultural Project

Pest insects can be a major source of frustration to the gardener. There is nothing more disheartening than having a row of bean seedlings toppled by a cutworm or a cabbage plant made unfit for the table by a ravenous imported cabbage worm. Luckily, over 95 per cent of insects in north-eastern North America are either beneficial or do no harm to crops. Furthermore, many crops can tolerate a certain amount of damage before yield or quality are affected. In fact, some crops are stimulated by a low level of pest attack. So don't panic when you see insects in your garden.

Avoid Pest Outbreaks

A strong healthy plant will be able to withstand pest attack better than a weak one, so it is helpful to give it the best possible growing conditions. If you have a choice, it is best to select a site with a loamy soil on a slight slope facing south with at least six hours of direct light. Soil quality can be improved by adding organic matter and other fertilizers.

Once the site has been chosen, the gardener can keep another step ahead of pests by choosing plant species and varieties appropriate to the conditions of soil, light, and climate in the garden. A good seed catalogue will give a wide range of choice and will often indicate conditions for which the variety is best suited. Some varieties are resistant to pest attack; for example, red cabbage is more resistant to the imported cabbage worm than green cabbage. In low light areas (six to eight hours of direct sun) shade tolerant, leafy vegetables such as lettuce should be grown instead of sun-loving species such as tomatoes.

Plantings of flowers here and there in the garden not only have an ornamental value, but also attract beneficial insects that prey on or parasitize pest species. The flowers provide the pollen and nectar necessary to the survival of the adult stages of many beneficial insects; it is usually the larval stage (e.g., cater-

pillar, or maggot) that feeds on the pest. Plants with small flowers such as dill, mint, and other herbs, alyssum, or a sprig of broccoli or two-year-old parsley gone to flower are particularly good in this regard.

Crop rotation, i.e., planting each crop in a different part of the garden every year, will help minimize pest attack, particularly by those species that spend all or part of their lives in the soil and migrate slowly, such as the potato nematode. This is also a good technique for controlling certain soil-borne diseases such as clubroot of cabbage. As different plant species place somewhat different demands on the soil, crop rotation makes more efficient use of soil nutrients and contributes to the health of the plants.

Losses to pests can be reduced by planting crops in patches, mixed with other crops, rather than in a single block. Cutworms, for example, can move rapidly through a patch of bean seedlings, but may miss another patch elsewhere in the garden.

Timing the planting of a crop so that the pest arrives too early or too late to attack it at its susceptible stage is a particularly effective method of control. For example, carrot rust fly damage to storage carrots can be reduced by planting the crop after the first generation of the pest has emerged and laid its eggs (plant about the middle of June in southern Quebec).

Some pests can be controlled effectively by physical barriers. Seedlings can be protected from cutworms by sinking a four-inch wide cardboard collar or tin can a few inches into the soil around the plant at transplanting time. Similarly, the cabbage maggot can be prevented from feeding on the roots of your seedlings by placing a square of tarpaper or cardboard around the plant as soon as you transplant it. The soil is home to many garden friends that can help to control the pests. These include rove and ground beetles, centipedes, spiders, and many others. You can make sure their home is comfortable for them by using a mulch (a layer of leaves, straw, newspaper, or other

organic material) between and within the beds. The mulch will keep the soil surface cool, moist, and dark, conditions that soil animals love. Adding organic matter in the form of compost, leaves, garden residues, and similar materials will help maintain these favourable conditions and stimulate the biological activity of your soil. The beneficial soil organisms will return the favour by eating the eggs and other stages of many of your pests.

Getting to Know Your Garden

It is essential to know your plants and the insects that attack them in your area. If you learn when they appear, where they spend the winter, how they produce, how to identify them, and the damage they do, it will be easier to plan and monitor your garden, and you will know when to apply an appropriate control measure. You can obtain this information from gardening books, publications of the provincial and federal ministries of agriculture, or gardening centres.

Probably the best way to get to know your garden is to spend time there every day. A garden is an exciting, fascinating place to be, always changing, always alive and buzzing with activity. Often, an observant gardener can catch a pest problem before it becomes serious by checking the plants frequently (especially the undersides of the leaves) for eggs and young larvae, holes, ragged edges, yellowing of the leaves, or wilting of the plant. Sometimes the pest can be controlled simply by picking it off and killing it on the spot. This is a particularly good method for large, slow-moving insects. Infected plants or plant parts should be removed from the garden and composted, buried, or burnt. This is a good technique for controlling leaf miners in beet tops and chard, for example. Often you may notice a predator such as a lady beetle at work; if you leave it undisturbed, it will rid the plant of the pest, and other control measures will be unnecessary.

(Continued on Page 37)

FUN FACT FABLE FICTION

by Ralph H. Estey
Emeritus Professor
Department
of Plant science

Artificial Insemination or Love's Labour by Parcel Post

Mr. E.B. White of the
New Yorker once wrote:

"I'm sorry for creatures
who
cannot pair
on a glorious day in the
upper air;
I'm sorry for cows who
have
to boast
of affairs they've had by
parcel post."

Huron Indian Gardening Accomplishment

Gabriel Sagard-Theodat,
in his "*Histoire du Canada
du pays des Hurons*,"
published in 1636, de-
scribed how the Huron In-
dians hastened the ger-
mination of seeds. The
women gathered rotted
wood which they crumbled
into fine particles and placed
in a box made of bark. In
this they planted several
times as many pumpkin
seeds as they were likely to
need. The box was
suspended high over a fire
to gently warm the rotted
wood. Although Sagard-
Theodat didn't mention this
in his account, it is likely
that microbial activity
played a significant role in
the warming process.
Anyhow, the seeds ger-
minated in a few days, and,
when the seedlings were of
the proper size, they were
separated and planted in
selected places in the
fields.

*Not many sounds in life,
and I include all urban and
rural sounds, exceed in in-
terest a knock at the door.
— Charles Lamb (1775-1834)

May Day

The original purpose of
May Day parades and
celebrations was to focus
attention on plants. It mark-
ed the renewal of life in
vegetation following the
winter dormant period.

In the Middle Ages May
Day was one of the most
popular holidays in the
villages of Britain. All
classes of people were up
early to go "a-maying." Branches of trees and
flowers were brought to
decorate the churches and
to the Maypole, glorious
with ribbons and wreaths.
Villagers danced around
the Maypole holding the
ends of ribbons that
streamed from its top.

The Puritans considered
this dancing a heathenish
custom, and Maypoles
were forbidden by the
British parliament for
several years. The fact that
the Puritans frowned upon
May Day is the basic
reason the day has never
been celebrated in America
with the same enthusiasm
as it has in Europe.

Between 1887 and 1889
the major socialistic parties
of the world chose May 1st
as a day for labourers to
show their unity by holding
parades and other
demonstrations. Conse-
quently, May 1st is Labour
Day in Britain and most of
the industrialized countries
except for Canada, the
United States, and one or
two others.

Knowledge

If a little knowledge is
dangerous, where is the
man who has so much as to
be out of danger? — Thomas
H. Huxley (1825-1895)

Standing Room Only

If the human population of
planet Earth goes on in-
creasing at about its pre-
sent rate for another thou-
sand years, there will be 20
million times as many peo-
ple as at present.

*When tillage begins, other
arts follow. The farmers
therefore are the founders
of human civilization. —
Daniel Webster (1782-1852)

*The illusion that times that
were are better than those
that are has probably per-
vaded all ages. — Horace
Greeley (1811-1872)

Not Superstitious

A gardener had a
horseshoe hanging over the
door of his greenhouse. His
neighbour was surprised
and asked whether he
believed it would bring good
luck to his seedlings. He
answered: "No, I am not
superstitious. However, I
have been told that it works
even if you don't believe in
it."

*As a work of art, I know
few things more pleasing to
the eye, or more capable of
affording scope and gratifi-
cation to taste for the
beautiful, than a well-
situated, well-cultivated
farm. — Edward Everett
(1794-1865)

Onions may Ward off Heart Attacks

The scientific name for
the onion (*Allium cepa* L.)
comes from the old Latin
name for garlic, allium, or
from the Celtic all, meaning
pungent.

The native home of the
onion is not precisely
known because it can be
found growing in a
relatively wide range of
environmental conditions
from Egypt and Syria to
India. The plant has been
cultivated for more than
2500 years and was well
liked by the Israelites
before the time of Moses.
(Numbers 11:5)

Onions, and the related
chive and garlic, were
prized by the ancients for
their medicinal qualities as
well as their flavour.

For many years, French
farmers have been treating
horses with poor circulation
of blood in their legs and
feet by feeding them
onions. Controlled
experiments among
patients in Newcastle,
England, demonstrated that
those on a diet heavy with
onions not only suffered
less from blood clotting
than did those without
onions in their diet, but also
were more resistant to
blood clotting, even when
given fat-enriched meals.
Adapted from articles in "*New
Scientist*" Feb. 1969 and Oct.
1972.

*There are some things
that one has to tell in the
strictest of confidence
otherwise no one will listen.

Typographical Error

Ninety per cent of the
mistresses on YMCA hostel
beds are not fit to sleep on.
They are lumpy and
uncomfortable.

Food and Medicine from Farmyard Weeds

by Wendy Dathan
Acting Curator
McGill University Herbarium

A quick look around almost any barnyard at the most ordinary weeds growing there will reveal quite a number of plants that have not only taken advantage of every unused corner but are also often remarkably good to eat and useful to know for their medicinal properties.

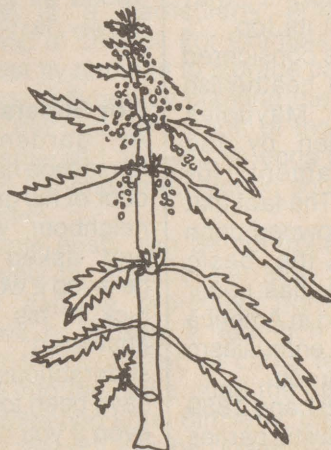


Illustrations by Christine Rafuse, Postgraduate Student, Department of Plant Science

A plant that often thrives in this situation is dwarf mallow (*Malva neglecta*), a low-growing plant with rounded, lobed, palmately veined leaves, small white flowers, and tiny, disk-shaped green fruits that look like miniature cheese rounds. Young dwarf mallow leaves can be cooked and eaten like spinach but tend to be somewhat slimy used in this way, due to their mucilage content. Because of this property, they make an excellent base for or addition to soup, giving it a smooth texture and a delicate flavour. This species, or one very closely related to it, laced with garlic, is used to make melokhia, the classic soup of Egypt, which is not only delicious to taste but also extremely beneficial for the entire digestive tract, as the mucilage from the mallow coats and soothes the intestinal walls and the sulfur glycosides in the garlic act as a natural internal disinfectant. In large quantities, mallow has a safe and gentle laxative effect.



Pineapple weed (*Matricaria matricarioides*) will sometimes take over a hard-packed or stony area outside a barn or along the edge of a driveway. This is a tough little plant, with finely dissected leaves and small, rayless, composite flower heads that not only look rather like miniature pineapples but, if crushed between the fingers, even emit a pineapple smell. The dried or fresh flower heads can be used for a tea that has the same flavour and properties as German chamomile (*Matricaria chamomilla*) which is widely used, both internally and externally, as a soothing, healing, and anti-allergenic remedy due to a highly effective essential oil, among other constituents.



Where there is plenty of manure or an exceptionally fertile soil, there are stinging nettles (*Urtica dioica*) which in favourable locations will grow as tall or taller than a man. Stinging nettles have ridged square stems, opposite, coarsely-toothed leaves, and small greenish flowers hanging in long, loose clusters from the leaf axils. Once touched, never forgotten; the stems and leaves are covered in

rough hairs that contain the same substance, formic acid, as is found in stinging ants. Gathered carefully to avoid contact with the irritant hairs, young nettle tops make a healthful, not exciting vegetable and a good basis for a delicious cream soup. They are high in potassium, plant protein, and vitamins. The water from the cooked greens can be saved for a skin or hair tonic and for soothing wounds. It will not keep long in the refrigerator but can be frozen in ice cube trays for future use in small amounts. Fresh nettle leaves have been used to relieve the symptoms of arthritis and rheumatism but this is a not-to-be-recommended remedy acting on the principle that an awareness of an external sensation will cause one to forget internal aches and pains. This is the general effect of off-the-shelf athletic ointments, except that nettle stings would be considerably more painful.



A plant requiring no introduction that is considered really helpful for rheumatism, and even more specifically useful for gout, gall bladder, and liver problems, is the dandelion (*Taraxacum officinale*). From a culinary point of view, the best time to eat dandelion leaves is early in spring, before flowering time, when they are pleasantly bitter but not unbearably so. The developing bitterness, which increases with age, is from a compound called lactucipicrine found in the milky sap. All parts of the plant contain it so the whole plant may be considered as a bitter tonic. Boiling the root, leaves, or flowers

and discarding the water, once or several times, will extract the bitter principle and make even an olderandelion into excellent food, but this will reduce the medicinal usefulness and the very high vitamin content.



Another weed with useful properties to know is the common plantain (*Plantago major*), that unlovely plant that grows in flat, unwanted rosettes on every lawn it can find and flourishes in waste places where it races to produce dense, narrow spikes of conspicuous flowers and tiny capsules that split in half around the middle and spill out a profusion of minute seeds to continue their invasion of the world. Like the mallows, plantain contains a high percentage of mucilage which can be extracted by infusion to give a soothing, coating effect on a sore throat or inflamed eyelids. The crushed plant makes an excellent poultice for healing wounds as the mucilage has a heat-retaining effect and there may be an antibiotic property involved. Plantain leaves can be used fresh in salads or cooked as a green vegetable when very young, but they will never make the gourmet's fruit unless accompanied by a particularly exciting sauce. Sylvia Boorstein has a good recipe for Sweet and Sour Plantain in *Wild Plums in Branches*, McGraw-Hill Co. of Canada Ltd., Toronto, 1969.



Wild greens that have been

featured in magazines such as *Gourmet* include the ubiquitous lamb's quarters (*Chenopodium album*), which quickly transcends its lowly origins in the hands of an expert cook. Lamb's quarters are easily recognized even when quite young. The diamond-shaped leaves are greyish-green in colour and covered with a white, powdery mealiness that can be rubbed off the surface although this is not necessary when preparing the greens. The young plants or plant tops can be eaten raw in salads or cooked to make an excellent spinach substitute, high in calcium and vitamins A and C, higher even than spinach in all cases. The plant is not used medicinally although a closely related species (*Chenopodium Bonus-Henricus*) has been used in compresses for skin complaints. Lamb's quarters would be a good source of calcium for people who are unable to digest milk or milk products.



Every farmyard undoubtedly has wild strawberries (*Fragaria* spp.) growing somewhere, with a wild red



raspberry (*Rubus idaeus*) cane or two not too far away. The fruits of both are cooling and delicious, contain vitamin C, and need no description; they are quickly learned by the smallest child.

The leaves, dried away from the sun until quite brittle, make a tea that is pleasant to drink and good for diarrhea, due to the tannin content.



Another significant weed used as a tea plant is yarrow — *Achillea millefolium*. Yarrow contains a bitter compound and an essential oil and has been used since earliest times to stop internal and external bleeding. An infusion of the above-ground parts, including the umbels of white to pinkish flowers, drunk as a tea, makes a bitterish but palatable drink and a good tonic, helpful for improving a poor appetite and even recommended in serious cases of anorexia. The fresh leaves, which are deeply and finely divided (giving the plant a lacy appearance), are pungent to the taste buds. They make a good addition to a salad if chopped and added in small quantities and, if chewed, will help to relieve a toothache.

Many other common weeds of garden and barnyard have edible and medicinal uses that deserve investigation. They must, however, be correctly identified before use. If used as medicine, the plants should be prepared properly and measured for exact dosage, following methods described in a reputable herbal. Poisonous plants should never be used by anyone outside of the medical profession. In addition, self-diagnosis of any serious health problems is not advisable nor should continuing minor symptoms be self-treated for too long without consulting a doctor.

Books recommended for the beginner include: — *A Field Guide to Edible Wild Plants* by Lee Peterson, Houghton Mifflin Company, Boston, 1978, *Use of Plants for the past 200 years* by Charlotte Erichsen-Brown, Breezy Creeks Press, Aurora, Ontario, 1979, and *The Herb Book* by John Lust, Bantam Books Inc., N.Y., 1974.

Prof Profile

Over the years Dr. E.R. Norris of the Department of Agriculture has been one of the Journal's most willing writers and regular contributors. As his articles have covered various aspects from noise pollution and safety to purchasing and maintaining farm machinery, they have also been among the most read by our subscribers. We thought we would like to delve a little deeper into Professor Norris's knowledge of different machines — from hay mowers to lawn mowers — and into the man himself: what makes the machine tick; what makes the man tick? What type of academic tells his students to "go fly a kite" and means it? We asked Professor Norris' colleague and friend Registrar Stephen Olive to do the interview. Both men have considerable expertise in things mechanical; they have a love of tinkering and are often found under the hood or in the workshop. It was a lively, friendly, often humorous exchange which resulted in material of interest to all.

Stephen Olive is a Mac graduate; he received his B.Sc. (Agr.) in 1968, majoring in Food Management. Born in Ottawa, Steve's family moved to Como, Quebec, and then to Quebec City before returning to the MacDonald area. "My family were PR, hotel, and restaurant oriented people so it was not unusual for me to be interested in the Food Management program. I guess fellow classmate Gerrit Lekkerkerker and I were breaking new ground for males in the till then predominately female area of studies, but we enjoyed them." Mr. Olive admits to not being a star pupil — "I was a star bridge player." After graduation he spent several years managing the Stewart Dining Room here at Mac. "How did I wind up being Registrar? Instead of the management of food, inventories, and recipes, I'm now working with data regarding student records — it's still management." He managed an interesting interview with Eric Norris.

Steve Olive: *What's the family background?*

Eric Norris: My roots. Small town Ontario — a 200-acre mixed farm near Mitchell which is close to Stratford. I went to the traditional one-room eight-grade school house and then on to high school in Mitchell with some 250 students. There were five of us, two brothers and two sisters. One brother is still running the farm which is now a dairy operation. It's a Centennial farm and has been in the Norris name since 1863. My brother has a son whom he hopes will continue the tradition.

Steve Olive: *Given your current interest in machines, did you learn to break them when you were on the farm or did that only come at university?*

Eric Norris: I always had an interest in machinery, and I have tinkered with machines as long as I can remember.

SMALL MOWERS, BLOWERS

Steve Olive: *What should the buyer look for when buying a small riding mower or a regular lawn mower for a 1,500 square foot lawn?*

Eric Norris: When buying a lawn mower there is not too much choice because these machines are all made by two or three manufacturers and then brand labels are put on them. I'm probably old fashioned, but I believe in keeping it simple. If you have a large estate to mow, then certainly you will need a riding mower. I think it better to get a tractor that is more a tractor than a motorized lawn mower. Get something that has a good hydrostatic transmission that will back up and go forward easily and quickly without clashing gears or slipping belts. Some of these belt-driven machines are terribly unreliable. Again, with the small lawn mower for the average lawn, keep it simple. Don't bother with wind-up starts; they are just a source of annoyance and cost more money for repairs. A simple recoil pull start is just fine. Many machines that are on the market have lots of sheet metal or plastic covering the entire engine, and when you have to do one simple thing, you have to strip all this stuff off. It doesn't make any sense. Electric lawn mowers are reliable and are a great idea for a relatively small job,

It was natural that I end up in agricultural engineering even though in my last year of school I had forms filled out for the University of Toronto's engineering physics program. As a 4-Her and Junior Farmer I made various trips, including some to Guelph. During one of those trips I became aware of an agricultural engineering program there and about Easter of my final year I tore up the lot of T forms. This shows how important it is for colleges and universities to have good liaison with high schools. At that time one of the advantages of studying at Guelph was that you could learn all about agriculture and get a degree from the University of Toronto — a prestigious university — without spending four years in the big city which I decided while putting down bales of hay in the barn that I didn't want to do. I got another degree from another University but I didn't move.

but they have an annoying high pitched sound. As well, they don't have the power of an internal combustion engine simply because that kind of power cannot run through an ordinary extension cord. I would prefer an internal combustion engine for larger, more difficult lawns.

Another small machine is the rototiller. Our Department got a rototiller a few years ago for some experimental plot work. It is a front tiller that simply pulls itself along and is really not satisfactory. It may be more expensive, but a rototiller with a transmission and the tiller tines behind the driving wheels is preferable.

Steve Olive: *What about snow throwers, snow blowers, single stage, two stage?*

Eric Norris: Unfortunately, my two sons won't let me get a snow blower because they like the bonus that goes into their allowance when they shovel the drive. From what I do know about them I would say that a minimum of 5 hp, probably 8 hp, is needed for the heavy snow that we can have. If you are going to clear a driveway well, you need something that size with as many forward gears as you can get because when you get into heavy snow you want to be able to create

started a Masters program at Guelph at the time when it became an independent University. So my Masters degree is from the University of Guelph; all I did was switch Deans.

Steve Olive: Some time after your Masters is, I believe, when you first made contact with the amazing clansmen of Clanranald and their descendants here at Mac.

Eric Norris: We have Bob Broughton to blame for that — he and the American Society of Agricultural Engineers, an organization that I have been involved with since I was a student. In 1965 while I was a graduate student there was a gathering of members from this organization from over the northeastern United States and Canada at Guelph. Professor Broughton appeared on the scene with a group of Mac students,

and I ended up talking to him long into the night about a job here.

Steve Olive: It was about this time that you took up permanent residence with at least part of your current family.

Eric Norris: You're referring to marriage! Shortly after the prospects for gainful employment became firmer I married the girl back home (at least one township away) and arrived at Macdonald in September 1965.

Steve Olive: You have two boys and a girl and I know you've been very involved in the past as a leader of the Beavers and a coach of the local soccer team.

Eric Norris: I have also always been very involved in community and church activities. I'm in the church

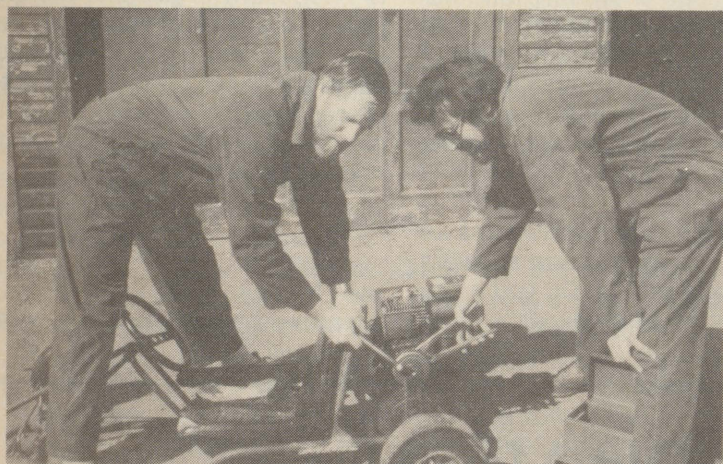
choir, I'm part of the session of our church, and I've been on the church property committee. I also enjoy camping, making homemade beer, and, of course, tinkering.

Steve Olive: Within agricultural engineering what are your primary areas of interest and expertise?

Eric Norris: I did research in my graduate studies on the physical and mechanical properties of biological materials as they affect machinery functions. Why the mower doesn't cut as well as it should is not just a mechanical thing; it is a biological thing. The fact that it is difficult is really the thing (I'm waving the flag) that makes agricultural engineering one of the most exciting professions both in the university and out there in the world. We are working with very predictable and mechanical things, but they interact with unpredictable biological things. A mower or a milking machine has to be compatible with a hay crop or with a cow. There is nothing more unpredictable than a cow! No offense to the dairy farmer but the cow is a biological organism with which one has to cope. As well, we have to make machines that are attractive and handy to use so that people will enjoy using them. In the last three or four years two projects have mainly kept me busy. I had a couple of graduate students working on combine design. We found a great lack of information about the effect of a simple thing like the spacing of the bars on the concave of a combine and the effect of that on threshing efficiency. I hope to revitalize that research shortly. As well, when the rotary or axial combines came on the market I was not convinced that that was a great advance in agricultural machinery. Changes in the design were made in order that the combine would fit on flat cars because it kept getting bigger and bigger, but I would have preferred to see some more changes in the traditional combine.

The other research that I have been working on has been with fluid planters. This came about as a result of a senior student project. Quite often some of the most interesting things that we do are connected with these projects, which usually involve research of some kind. A student built

OLD TILLERS



Tinkers Steve Olive, left, and Eric Norris at work on their go-cart.

ong very slowly. If the machine is going to sit in cold storage, an electric start would be advisable.

Steve Olive: Two-stage presumably. There are machines with single stage now throwers and invariably they don't last.

Eric Norris: Yes. You need the auger and the fan to throw it to get a proper job done.

Steve Olive: What about the safety aspect of these machines?

Eric Norris: A snow blower is the one that causes the most concern. It has the dead man clutch on the handle-

bars. You have to hold onto the handlebars in order for the machine to function. That way you can't leave it running and get your hands into the workings.

The rotary lawn mower has to have a tip speed on the blade in order to cut — it works on impact. You can shield it all you want but people will persist in getting their toes underneath there or cutting the lawn in sandals, sneakers, or even bare feet. They will also go out with an electric lawnmower in bare feet in damp grass! You cannot always protect people against their own carelessness. You have to assume that they have some level of common sense.

a very small fluid planter a few years ago and it worked reasonably well. This machine plants pregerminated seeds by extruding them out in a gel. This means that you have already got the germination over and done with, and the plant is ready to grow rather than sit waiting for suitable temperature and moisture conditions to occur. One advantage of this system is that you can get tomatoes, for example, to market earlier than other growers.

As far as teaching is concerned, I have to be fairly flexible. Today, for example, I spent two hours teaching Diploma students how to weld followed by one hour of teaching the theory of vibrations in a graduate course. In 10 minutes I had to switch modes of thought, and that is one reason why I find teaching really quite an exciting occupation. To be able to go from the very practical to talking about developing the differential equation for motion of a tire bouncing over a field is certainly fun.

Steve Olive: *Tell us about the kite flying.*

Eric Norris: For a few years I taught a course in material science and the final assignment was to build and fly a kite. It provided a stimulating experience, since not only did the students fly kites but part of their assignment was to set up a system of

surveying and a radio link to the computer centre so that through walkie talkie communications they could tell each other how high the kites were flying. It was an exercise in surveying, in using the knowledge of material science, as well as a little bit of aesthetic engineering design.

Steve Olive: *Your Ph.D came some time after you began your academic career.*

Eric Norris: After being here for three years I thought I had better go back to school and I went to Michigan State University. Going to a land grant U.S. university was an interesting experience. They get things done. They'll marshal the resources of several departments for a particular project and then attack it. In my mind, in agriculture at least, the university is better integrated with industry than in Canada, and many of the staff have to spend some time right out in the field finding out what the farmers' problems are and then going back to the lab to see what they can do about them. I found that very stimulating. In Canada, we lack this approach in terms of doing it consciously — some people do, some don't.

Steve Olive: *You are involved in a lot of consulting, questions and answers for farmers and others. Do you enjoy that phase of being an expert?*

Eric Norris: It's certainly interesting. The really good questions are those for which you don't have an answer, and they stimulate you to go and try to find the answer. I also enjoy the occasional opportunity to talk to farmers about machinery and management. It is all part of trying to maintain a balance of your activities. Just find me a few more hours in the day.

Steve Olive: *You are currently a Senator of the University. You are past Chairman of the Faculty and of the Curriculum Committee. Do you like that phase of the necessary day-to-day operations?*

Eric Norris: I enjoy people. To be on the Senate of McGill allows a person to have interplay with interesting people from all over the University. Being Chairman of the Faculty allowed me to be involved in decision making and, I hope, to facilitate the decision making that went on. I enjoy the University because it is people. The student body is made up of young people who are vital, have new ideas, and are stimulating. It is one of the greatest places to work because of that kind of excitement that goes on and I'm hopelessly hooked.

(For Professor Norris's comments on the agricultural machinery industry see page 27.)

That Good Old Mac Magic

by Ann Louise Carson,
B.Sc. (Agr.) '81

Growing up in rural Quebec "Mac" was a commonly used word in the vocabulary of the people surrounding me. In the back of my mind, I knew Macdonald was an educational institution. After all, my grandmother, my father, and my brother had all obtained their technical training here, along with countless other teachers and dips I knew.

However, Mac intrigued me for reasons other than the academic life. I was always amazed by the stories of "Mac student life." No matter what the story or who the storyteller, the "Mac Magic" was always there.



The Livestock Show brings friends and former participants together, including, top, left to right, Charlotte Griffith, B.Sc. (F. Sc.) '83, Ann Louise Carson, B.Sc. (Agr.) '81, Nora Clancy, B.Sc. (Agr.) '82, Peter Griffith, Dip '80, Lois Fowler, Dip '80 and, at present, a second-year (U2) student.



During CEGEP, I realized I wanted pursue a career in agriculture. At this point I was quite familiar with Macdonald as it was the location of the provincial office of the Quebec Young Farmers, an organization with which I had become quite involved. After graduation, I continued to work with QYF out of the Macdonald office.) Working at Mac seemed like the perfect solution: a chance to be in close contact with QYF, to obtain an agricultural education and, most importantly, to check out these Mac stories for myself! We all know that Mac offers a very high quality of academic training. However, in my opinion, the greatest education Mac offers its students is the informal education obtained after class time. The Mac I enrolled in was not the same as earlier graduates had experienced. The oval was not a threat should I say the Knights of the Oval, and I attended classes in Raymond, not in Main. However, this was Mac and I was determined to find out more of that Mac magic.

I soon realized that people is what Mac is all about — both the student population and the Faculty. Macdonald is a cultural mosaic composed of English and French Canadians, foreign students from a countless number of interesting countries and, of course, those fun-loving Swampies and Maritimers for non Mac readers!). Meeting the people is an education in itself and the best way to do this I found was to get involved! It is through a high level of involvement in student life that you meet and get to know your fellow students and staff,

Above, left, Jim Fanning, centre, of the Montreal Expos, was this year's special guest at the opening ceremonies for the Woodsman Competition held in late January. He is pictured with Bill Ellyett, Director of Athletics, and Bob Watson who for years before his retirement was the coach and inspiration behind the Woodsman. His son, John, now coaches the team. Above, to the delight of the early morning crowd of Macdonald and visiting teams from Quebec, Ontario, the Maritimes, and the United States, friends, and spectators, Jim Fanning and Bob Watson do an excellent job of felling to open the Competition. The Woodsman Competition and the Macdonald Royal and Livestock Show are two of the most popular student events. The Livestock Club, which is one of the oldest Clubs at Mac, also invites visiting teams to their two-day event held in February. The same spirit and good will at both these events has been handed down through generations of students. We hope the photos on the next few pages bring back memories for some who have participated in similar events.

and they get to know you. In many ways being an active student is giving yourself the best preparation possible for the real world. Nowhere than on this campus is the saying "you reap what you sow" truer — and not strictly in agricultural terms!

During my three years as a student at Macdonald, I had a double major in Woodsman and College Royal (not to mention my minors)! These two activities provided me with countless numbers of close friends. When you spend 12 hours in a van with 20 people, you definitely get past the "how are you" stage. Sure, the endless hours I spent at early morning practices or at the barn training my cow to lead just right could have been spent in other ways. Am I ever glad they weren't.

Participating in activities is important but organizing them is even better. This is when you learn about yourself — your strengths and weaknesses. The apprenticeship is most valuable for later, as I found out. Employers are looking for staff who

can deal with people and day-to-day life — all things you learn by being involved. Without a doubt being an active student prepared me for the real world but the main reason I did it was for "fun," and that is what the Mac magic is all about.

Macdonald College is no longer "my Mac" as my group is spread across the country. However, I have attended the Livestock Show and Woodsman Competitions for the last two years and let me assure you the Mac Magic is still there. People were cheering for each other, lending a hand whenever a fellow student needed it, and they were all having fun.

I very much enjoyed my years as a student at Macdonald, and although I did attend classes and wrote exams, it is the other part of Mac which made the years memorable. When I was younger I was always intrigued by the fact that whenever people told stories of Mac, they were happy and funny stories. Now, having gone through it, I know the "Mac Magic" lets you remember only the good things.

WOODSMEN COMPETITION

Our cover shows Ronnie Quilty, Cornwall, P.E.I., U2, Pierre Yves Gasser, Pike River, U2, and John Hoskins, Farnham, Dip II, participating in the pulp throw. Other events include felling and twitching, quarter split, snow shoeing, chain throw, and water boil.



Dave MacKenzie, U3 Mac student from P.E.I., in the axe throw event.



Judge Jim Currie and a member of the Laval team watch John Abbott CEGEP student in the dot split.



Judge Ann Louise Carson watches intently as a member of the Dawson CEGEP team carefully works on the pulp pile.



Nova Scotia Agricultural College women's team work hard in the Swede saw event.



Dave MacKenzie, Pierre Lemieux, Scott Wile, and Martial Major in the cross cut event.



Members from Sir Sanford Fleming practice essential teamwork in the log roll.



crowd enjoyed NSAC men's Swede saw endeavours.



Above left: Against a backdrop of the Macdonald-Stewart and Barton Buildings, Pierre Yves Gasser participates in the chain saw event while in the background a competitor practices for the pole climb. Above: The new pole climb event drew a large audience as climbers attempted to ring the bell at the top and rapidly descend to a soft landing — all in record time.



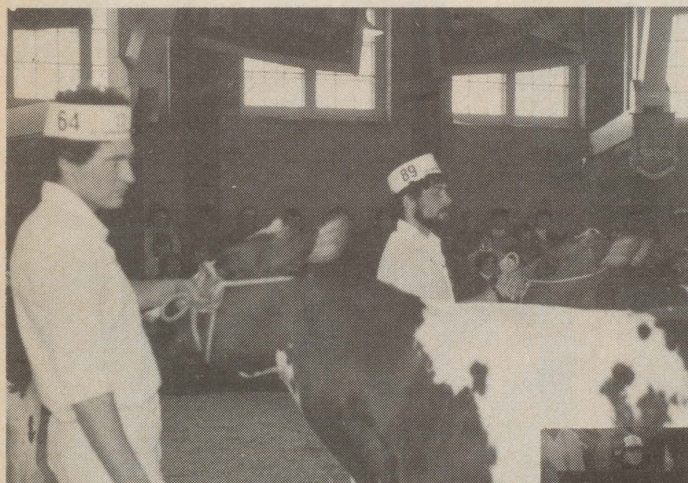
Sault College women put all their efforts into speed chopping.

THE MACDONALD ROYAL AND LIVESTOCK SHOW



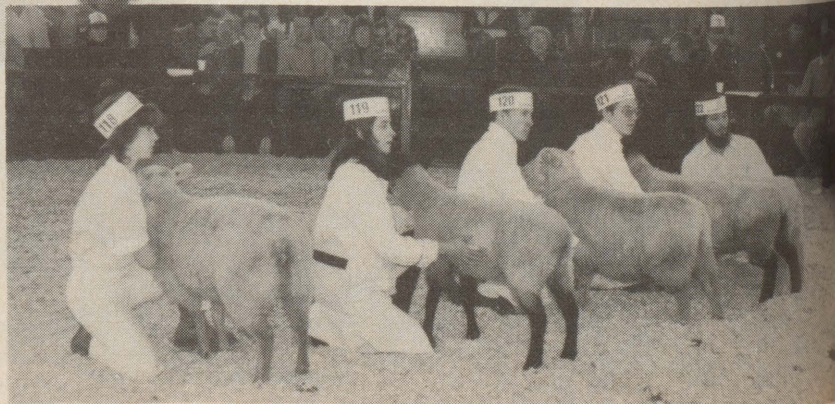
Above left, Judges Kenneth Roy, Howick, and Ralph MacKenzie, Finch, Ont., examine the swine showmanship of Jean Guy Fournier, Lachute, U2, and Nancy MacLean, Truro, N.S. U3. Above, Lois Fowler, Kingsbury, U2, won the Jim Houston Trophy presented to the individual who contributed the most to the Livestock Show.

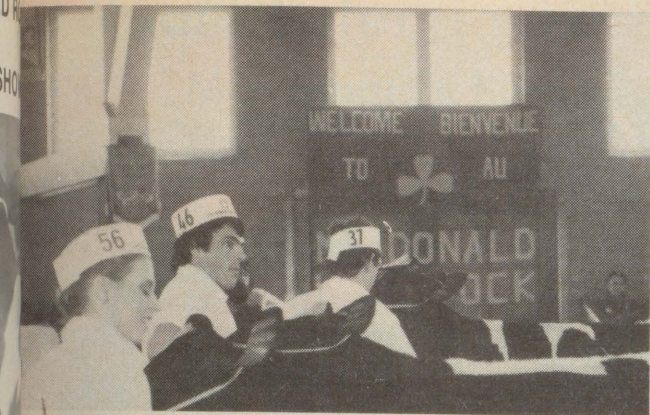
Centre, Gordie Beaulieu, herdsman, and, far left, Sandy Barclay, B.Sc. (Agr.) '49 are among the many spectators watching the novice class.



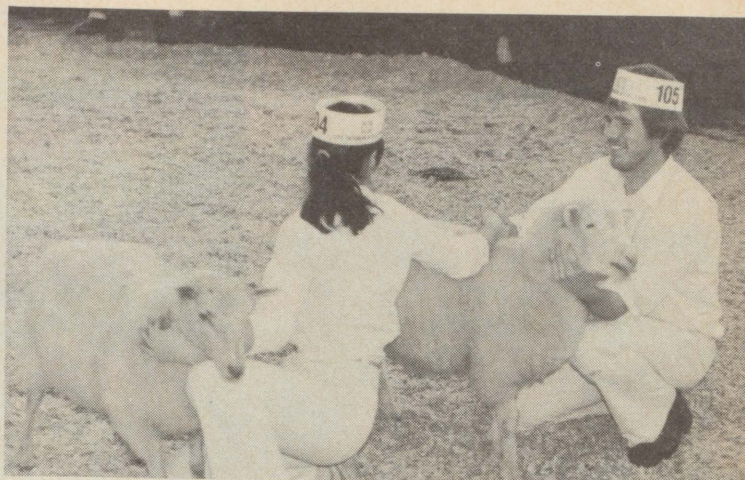
Among the spectators were Townshippers Donald and Carolyn Coates, Lois Miller, Neil Burns, Dip '82, and members the University of Vermont judging team, one of several teams invited to participate in the Show.

Above: Lindsay Broadhurst, Lennoxville, Dip I, and John Riordon, Bathurst, N.B., U2, Reserve Ayrshire Showman and Grand Ayrshire Showman and, right, members of a preliminary sheep class only have eyes for the judge!

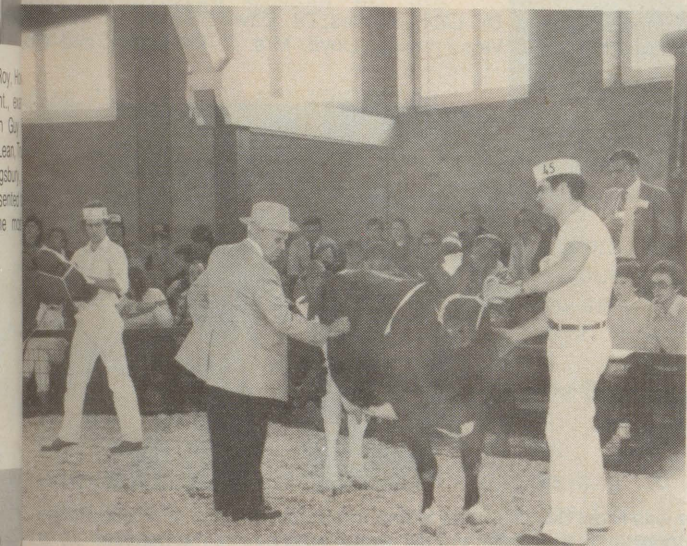




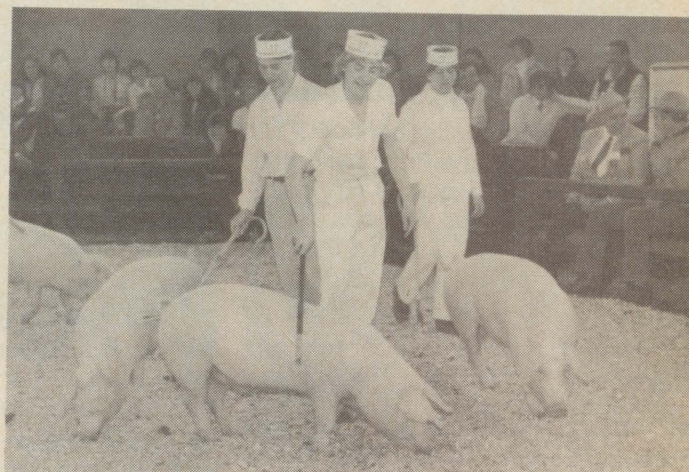
Grand Champion Showman Sheila Stewart, Wakefield, U2, and Francois Drolet, St. Raymond, U2, in one of the preliminary events.



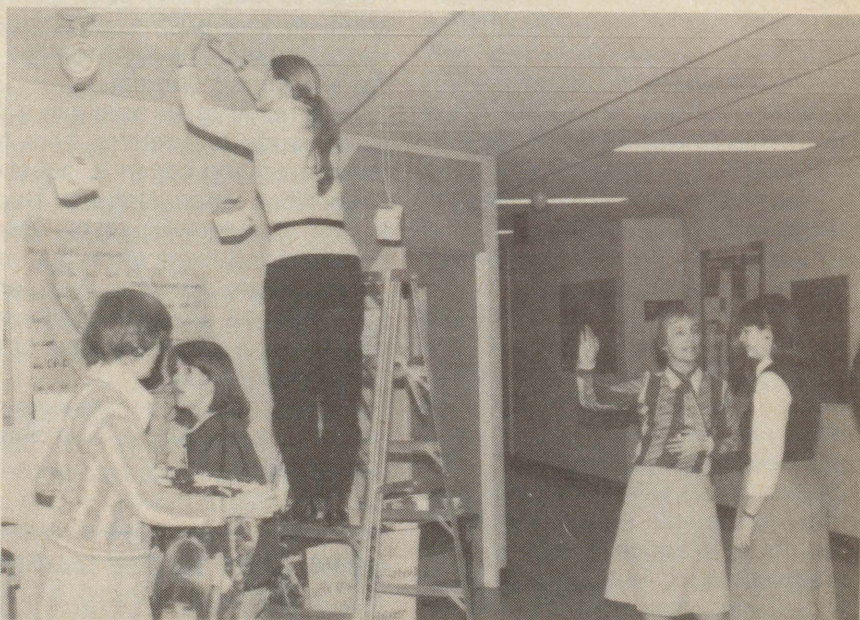
Smiles and congratulations. Reserve and Grand Champion Sheep Showmen Beverly MacDougall, Antigonish, N.S., U3, and Alex Crouse, Wolfville, N.S., U2. Happy Maritimers!



Judge Ralph MacKenzie examines the cow being shown by Jim Hammond, Lachute, Dip II, while Lindsay Broadhurst looks on.



Among the swine showmen were: Marg Zillig, Scotch Village, N.S., U2, Angus MacKinnon, Coaticook, Dip I, and Pauline Kaye, Baie d'Urfé, U1. Angus was the Reserve Dairy Showman and Pauline the Reserve Swine Showman.



Animal Science, Food Science, and other Departments and student groups put on interesting displays, films, and demonstrations in the Macdonald-Stewart Building as part of the Royal show.

FOUNDER'S DAY

by Stephen Olive
Registrar

Founder's Day has come and gone for another year. This year saw a return to a more traditional observance of the anniversary of the birth of Sir William Macdonald, February 10, 1831. The celebration was highlighted by a banquet attended by 350 invited students, staff, and friends. Guests at the Head-table were Dr. David M. Stewart, Mr. Hugh Halward, Chairman of the Board of Governors, Vice Principal (Academic), and Mrs. S. Freedman, Vice-Principal (Macdonald Campus) and Mrs. L. Lloyd, Mr. Nigel Bayliss, President of the Students' Council, Dr. William Rowles, Dr. Laura Rowles, and Vice-Principal (Administration and Finance) and Mrs. John Armour, guest speaker for the evening.

After a sumptuous banquet, Dr. Lloyd introduced Vice-Principal Freedman who had the honour of representing Principal Johnston who was unable to attend. Dr. David Stewart then reflected upon the history of Macdonald and the vision of the Founder in establishing a number of educational institutions throughout the country.

Vice-Principal Lloyd then introduced Mr. Armour and his subject "Lang May Your Lum Reek or May Your Ashes Never Grow Cold." From here until the end of his remarks, the audience was treated to a delightful mixture of mirth and reflection about Macdonald, where it has come from, and where it is going. Mr. Bayliss thanked Mr. Armour for his efforts and presented him, on behalf of the Clan Macdonald, a pewter mug emblazoned with the Macdonald crest. Dr. Lloyd announced that the Founder's Day Committee was making a donation to the Palliative Care Unit of the Royal Victoria Hospital, in Mr. Armour's name.

The evening ended on a high note with Vice-Principal Lloyd introducing Emeritus Professor William "Pop" Rowles, the first recipient of the Mastery for Service Award. Dr. Lloyd reminded us that the Mastery for Service Award was established on the occasion of the 75th Anniversary of the founding of Macdonald and is to be presented every five years to an individual who has provided, through personal effort, outstanding contributions to the advancement of the Macdonald Community.



Founder's Day head table guests included: Dr. Laura Rowles, Dr. David Stewart, Mr. Halward, Mrs. John Armour, Vice-Principal Armour, Vice-Principal Lloyd, Mrs. S. Freedman, and Vice-Principal Freedman.



Left, also at the head table was Nigel Bayliss, President of the Students' Council. Right: Students staff, and guests had an opportunity to mingle and get acquainted before the banquet.

Thank You

For some time I have been debating and pondering just how I could express my gratitude to everyone who made my retirement such a memorable occasion. Hazel Clarke came to my rescue and suggested I would reach everyone through the Macdonald Journal.

As a result of an article in a previous issue re my retirement, I received many cards and letters from former students and friends that I was quite bewildered and began to question my decision.

My close association with students over the years will never be forgotten and I thank them for keeping me young at heart. Every day brought along a new experience and more often than not a memory cherished.

My sincere thanks to Paul Jensen, Class of '82, who organized the party on November 13, and to all students and staff who contributed to and attended the gala evening. The dedication of the CC Lounge will be an emotional experience I will never forget.

I truly wish I could thank everyone personally and am looking forward to many reunions in the future. God bless.

Affectionately,
Jean Vauthier.

COME BACK TO SEE MAC IN '83

Join us on Saturday, October 1, 1983. Watch for further news on this year's reunion. Everyone welcome, especially graduates of years ending in 3 or 8. Information: Macdonald Reunion Committee, 3605 Mountain Street, Montreal, Quebec H3G 2M1. Telephone: 514-392-4815, Susan Boyle.

10 Years Later

Macdonald's First Female Agricultural Engineer

to be able to combine marriage, a career, and postgraduate studies and to do so successfully takes ability, efficiency, desire, and determination. Suzelle Barrington showed that she had these qualities when she chose to pursue a career in agricultural engineering — the first girl to take the course at Macdonald. She returned to Macdonald in 1980 to continue her studies under the guidance of Professor Pierre Jutras who recently very kindly interviewed Suzelle for the journal.

Pierre Jutras: How did you get interested in agriculture? Did you have a rural background?

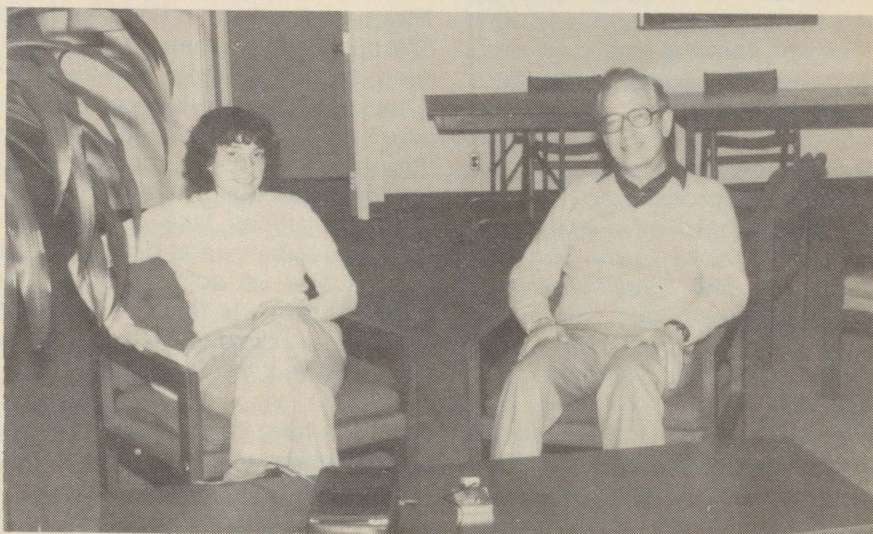
Suzelle Barrington: Yes, my father had a small dairy farm near Ottawa. I helped out with the labour end but not with any management decisions.

Pierre Jutras: When you heard about Macdonald, did you also hear about other colleges?

Suzelle Barrington: I did two years at Carleton University in Ottawa in pure sciences but as I didn't see too great a future in that area, I was considering either engineering or architecture. My roommate had a friend going through John Abbott CEGEP and planning to get her degree here at Mac. At that time I didn't even know that Macdonald had a degree program but when I realized there was one, that it was close to home and to relatives in Montreal, I made up my mind to come here.

Pierre Jutras: Why agricultural engineering? I thought that applied sciences rather than pure sciences would be better in engineering, and so I chose agricultural engineering. I found out on registration day that I was the first woman to apply for the course. Bob Broughton asked me twice if I really wanted to go through it. He was surprised by my choice, but my mind was made up. He registered me like everyone else and introduced me to my fellow students, and we got along fine.

Pierre Jutras: You graduated in 1973



Suzelle Barrington and Pierre Jutras compare notes on agriculture and other topics.

— 10 years ago. If you had to do it all over, would you? If other females were to ask your opinion, what would you say?

Suzelle Barrington: I would probably pick the same career. It was a little difficult getting an agricultural engineering job when I graduated. I had the choice of either doing my Masters or working, and if I was going to work I didn't want a research job which would have been easier for me to get. In 1974 I did find an extension job in Chateauguay as an agrologist. I did fertilizer and feed recommendations. It was good experience because I acquired a general background, and then in 1978 there was a position open in Huntingdon for a local engineer, which I took. As I enjoy my engineering work much more than the general agriculture work, I know I made the right decision.

If other women were to come to me, I would encourage them to go into agricultural engineering because people are more open to women in most jobs now. If women do go into agricultural engineering with very little farming background, they are going to find it difficult to get a job as employers are asking for some experience. I have interviewed a few women engineers for government jobs and some of them failed because of not having a farm background or experience.

Pierre Jutras: A number of girls have followed in your footsteps; some have gone into food engineering. Although it certainly would be helpful, a farm background there is not as important as it is in the production end. Suzelle, are there any recommendations you would like to make to the staff here in terms of improving the academic content or the teaching methods?

Suzelle Barrington: In my opinion the basic idea of university is not necessarily to make you learn things but to educate you as to where to find the material and how to go about finding it. Someone from university may not succeed because he has not developed that philosophy and there is a philosophy of self discipline that you have to pick up for yourself when you are at university. If you don't, there is half your career lost right there. You are on your own; that is one of the basic things to learn.

As far as agricultural engineering is concerned, one of the things that I have noticed when I interview graduates from Mac or elsewhere for jobs for the government is that they have very little background in general agriculture — in crops, in animal science, in soils. That is one of their weakest areas either when applying for a job or when passing the test to enter l'Ordre des agronomes. Going back to what I just said, possibly it is

the students themselves because there is a course at Macdonald in each of those areas. In my first job at Chateauguy I had to do a lot of reading, but I was able to retrain myself to become an agrolgist and to deal with farmers and their problems. And, of course, my rural background helped.

Pierre Jutras: *You're married and the mother of two children. You and your husband have an average size dairy farm in Howick and you help out. You are now studying for your Ph.D. here at Macdonald. How do you manage to carry on so many activities and do them as well as you do?*

Suzelle Barrington: Don't come and poke in my cupboards at home! I have to say that I have a very good husband who doesn't mind looking after the children occasionally. I admit to being efficient and, compared to some people, I can do the same thing in quite a bit less time. I also work a longer week than some. It is a question of interest. My graduate studies here mean a lot to me. When I started them, I found out how much I didn't know which I found encouraging. It kept me going. I started studying for a Masters and things went so well that within the time that my employer allowed me I had enough courses to continue on for a Ph.D. and so I continued.

I have seen some students do research to find out what to research, but I did not start my Masters until I had a very definite research project in mind. In our area 99 per cent of the farmers who have to build manure storage facilities have not built them because of the cost. In particular, I am looking at the pollution hazards of earth reservoirs and making recommendations on how to build them to reduce pollution hazards. If the government will accept the earth reservoirs as long as they are well built, we would see the percentage of farmers without proper facilities drop to maybe five per cent. It's a question of cost. Our province is probably the only one requiring concrete structures — it is the strictest.

Pierre Jutras: *Would you describe your job for us?*

Suzelle Barrington: In June I

became the regional engineer for the Ministry of Agriculture office in Chateauguy. I cover the territory from Soulange-Vaudreuil down to the border and over to the Richelieu. There are five local offices, and each office has an engineer. My job is to keep them informed of new technology and so on. My contact with Mac helps. I do most of the construction recommendations for the whole region while most of the engineers in the local offices take care of such things as subsidy and drainage problems. I also do some special management projects that are related to the area — I did one drainage project for 3,000 hectares last summer.

Pierre Jutras: *You studied on the old campus here at Mac, and now you are here in our new surroundings. Do you see any major changes?*

Suzelle Barrington: There is a good feeling here. From 1973 until 1980 when I came back, people told me that if they have to employ a graduate, they will pick someone from Macdonald before hiring someone from elsewhere. As well, many graduates have told me that there is no choice; it's Mac, and I think it is true that Macdonald is attracting more postgraduates than other places. When I talk to people in my field, I find that everyone knows the agricultural engineering professors from Macdonald. We hear of the work being done here whereas we seldom hear what others are doing.

I like the new campus. I still remember the old traditions such as the Oval, but the new facilities place everyone together.

Pierre Jutras: *Tell us about some of your other interests such as the Graduates Society.*

Suzelle Barrington: I am Nominating Chairman for the grad society. I am also a past president. I was president from 1979 to 1980 and had the honour of putting the last \$30,000 on the new building. 1980 was the year of the 75th Anniversary celebrations. As president I particularly enjoyed coming to Mac to give our scholarships to the students and attending Convocation. I really enjoy being active in the grad society, and I can honestly recommend that other

graduates get involved.

I am not in many organizations. I'm a member of l'Ordre des agronomes and of both the American Society and Canadian Society of Agricultural Engineers. For relaxation, I ride.

There is a riding school not far from home, and I take the opportunity to do a bit of riding and to take some lessons. Since we have a farm, I hope to eventually have my own horse. As there are professional women with whom I work at the riding school, there is also time for some social activity. I also do needlepoint when I have time.

Pierre Jutras: *Once you get your Ph.D., do you have anything special you want to do?*

Suzelle Barrington: When I get my Ph. D. there will still be some work to do in the line of research that I am working on. It might take a few years but I am planning to ask my employer if I can take some computer and math courses which I have not had time to do. I did take time to do work on pocket calculators, but I would like to do more work with microcomputers. I would also like to be able to build models and build them well.

We have to keep up with changes. The biggest challenge for any graduate is to sell his or her talents just as any company has to sell its products. As long as you are young enough to do it, you have to be able to change from one line to another within your specialty to suit the needs of agriculture. That is the only way that you are going to be able to stay up there. That is what I am trying to do with my Ph.D. There are not too many engineers who are specialized in waste management. In the government we have one engineer in Quebec City who has some knowledge of manure handling at the practical level. I think I am going to have the theoretical side. I am hoping that the Environment Ministry will rely on some of my recommendations.

I could go on — there have been so many advantages to studying at Mac and to have studied agricultural engineering: when I think of how planning things in systems has helped, I got a very good background both in my undergraduate and in my postgraduate studies. There are no complaints from me.

Seeking Solutions

PROFESSOR BILL MARSHALL of the Department of Agricultural Chemistry and Physics is continuing his work on development of a precise method of measuring the mycotoxin zearaleone. With the support of funding from Agriculture Canada, Professor Marshall will attempt to modify the radioimmunoassay method avoiding the use of scintillation counting. The technique he is currently considering is an enzyme-linked immunosorbent assay, which in spite of its name, is a relatively simple procedure. With a simplified assay, it will be possible to detect easily metabolites from several species of *Fusarium* formed in corn and cereal grains during storage. Such toxins have been implicated in hyperoestrogenism on swine and other livestock.

PROFESSOR ALAN WATSON of the Department of Plant Science has received new support from Agriculture Canada for his constant fight against weed pests. In this case he will develop models for integrated management systems designed to suppress yellow nutsedge. Nutsedge, as any corn grower in Quebec knows, has become a dominant weed during the past two decades. This is largely due to nutsedge tubers which are persistent, which cannot be killed directly by herbicides, and which serve as survival units for the weed. Professor Watson feels that management techniques such as crop rotation and timely cultivation can suppress nutsedge populations, but that they will be most efficient if they can be used to predict weed population changes, perhaps through modelling techniques. Professor Watson and graduate student **D. Cloutier** plan to start work this spring on the project.

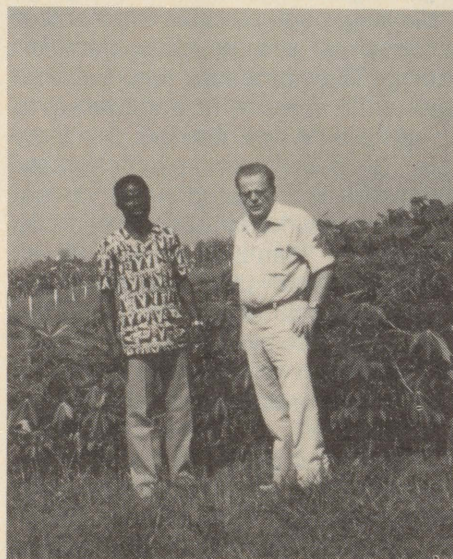
EF PRODUCTION in Quebec: is it viable over the long run? **Professor R. K. Coffin** of the Department of Agricultural Economics is looking at possibilities for this kind of enterprise, including consumer demand, production costs, and regional competition. Alternative feeding

programs and different sizes of operations will be analyzed, as well as the costs and returns to Quebec producers under different scenarios for grain and meat transportation from western Canada. The Crow Rate situation is lending urgency to Professor Coffin's study. His results should provide information on the return on investments as well as the most efficient form of investment. Producer and agribusiness decisions as well as government policies may well be affected by the results of this study.

INTEGRATED CONTROL of pests in apple orchards has many potential advantages: lower costs, reduced pesticide residues, better quality apples. But with the introduction of IPM (integrated pest management)

new pests may become important. **Professor R.K. Stewart** of the Department of Entomology believes that the green apple bug, which is relatively unimportant under the present control program, is the most likely mirid species to cause damage in orchards employing integrated control. As a start, he is planning to look at the effect of different densities of mirid pests on damage to apples and to monitor the green apple bug using techniques such as the beating tray and sticky traps. Sampling techniques could be refined and growers could then be advised as to the need for mirid control.

If this system works, the 1,230,000 apple trees on 6,000 hectares in Quebec could have a reduced spraying program that could save growers over \$1 million annually.



Samuel K. Asiedu and Professor Réal Pelletier against a backdrop of cassava in Nigeria.

Mac Student Studies Abroad

There is real international scope to the life and studies of the Max Bell "Open" Fellowship student Samuel K. Asiedu. This native of Ghana, who started his agricultural studies, as did many other Macdonald students, in Deventer, Holland, is at present working toward his Ph.D. from McGill while doing research in Nigeria. As Mr. Asiedu's supervisor here at Macdonald, Professor Réal Pelletier of the Department of Plant Science, pointed out, "we like to encourage Ph.D. students to spend a year or longer of their programs at another institution, particularly if they

have received either the B.Sc. or M.Sc. at Macdonald."

Samuel Asiedu received a Diploma in Agriculture from the National Agriculture College in Holland, followed by his B.Sc. (Agr.) '76 and M.Sc. (Agr.) '78 from Macdonald. His research topic for his Ph.D. is the "Development of rapid and reliable methods of testing the resistance of cassava to bacterial blight," and he is doing his research at the International Institute of Tropical Agriculture (IITA) in Ibadan, Nigeria. The Institute is one of 12 international agricultural centres supported by 30 donor countries, including Canada. Mr. Asiedu's supervisor at IITA is another Macdonald graduate, Dr. Eugene Terry — B.Sc. (Agr.) '64 and M.Sc. (Agr.) '66 — a root crop pathologist who did his Masters under Professor Ralph Estey.

Dr. Pelletier, who travelled to Nigeria in 1982 to see Mr. Asiedu and to check on his progress, told us that "bacterial blight is a serious disease of cassava which is a staple food in many countries of the world. At IITA, they are attempting to develop by breeding methods cassava cultivars that are resistant to the disease. In order to find the ones which are resistant from among the hundreds of offspring from the crosses, they need a reliable and rapid method of assessing that resistance."

When Samuel Asiedu has completed his Ph.D. he plans to return to his home country Ghana.

EFTS — ELECTRONIC FUNDS TRANSFER SYSTEM

by Lanita Carter and
Betty Stafford Smith
School of Food Science

The innocent among us, if there are any around, might say, "is that the sequel to ET?" and to many, the subject of electronic funds transfer system is as remote from the reality of everyday life as that of an extra terrestrial being. However, if you read the newspapers, walk around your local shopping centre, and make use of the banking system, you will have seen, read about, and used the systems which are or will be involved in what is popularly referred to as "the information society;" "the electronic age;" "the computer age;" "the cashless society."

If the predictions of those who are interested in the way our society functions are correct, we are passing from the industrial age into a new era made possible by the tremendous advances in electronic technology over the past two decades, particularly in the last two or three years. Society will base its method of functioning increasingly on the innovative systems of transmitting information electronically.

These changes have come about over the past 20 years as a result of advances in computer technology. Before 1970, the average computer often filled an entire room, and processing was relatively slow and laborious. However, computers did make available many processes which were previously impossible or prohibitively time-consuming. During the 1970s the size of the computer decreased and efficiency increased dramatically. Computer cards were replaced by video display terminals, enabling users to make changes or corrections to computer programs. Recently there have been incredible changes in the price and availability of microcomputers for home and business use.

Microtechnology has changed and continues to change our world as new advances in electronics are made. Grocery store check-outs are faster and more accurate because of the new Universal Products Code (UPC) scanners. Most people now own a calculator or a digital watch, both of which have dropped dramatically in price over the past few years. Many of-

fices use word processing units to edit letters and other written materials. All transportation systems and hotels use computerized reservation services, and most of us have tried the new video games available for home entertainment?

Probably of the greatest concern to consumers is the idea of a "cashless society." This phrase refers to the Electronic Funds Transfer System (EFTS), which is characterized by the use of computers in financial transactions. The use of electronic technology in financial transactions can reduce costs and provide more convenient and flexible banking services. In the beginning, the use of microtechnology in banking made possible the transfer of cheques and deposits between banks. This process has become faster and more efficient thanks to computers. Wage earners are now able to have their pay cheques automatically deposited in their chequing accounts. Many people also pay mortgage or loan payments by direct deduction from their chequing accounts. Computerized banking has also made possible multi-branch banking, enabling customers to make withdrawals or deposits at any branch of their bank.

Now consumers are experiencing a new dimension of computerized banking with the Automated Teller Machines (ATM). These machines are

usually located on the outside walls of banks or in shopping malls where customers can do their banking when the banks are closed. The customer can choose from a number of possible banking transactions including making deposits, withdrawing cash, paying bills, transferring funds from one account to another. To use an ATM, a customer must have a specially encoded plastic card similar to a credit card. This card is inserted into the machine and the customer enters his Personal Number Identification (PIN) into the ATM terminal. The banking transactions are chosen, the customer removes his card and receives a receipt for the transactions.

Similar to the use of ATMs is the use of a debit card. This provides a way for consumers to shop without ever using cash. To make a purchase a customer presents his card and enters his PIN number on the store's point-of-sale (POS) terminal. The sale is automatically debited from the customer's chequing account and credited to the merchant's account. This banking scheme, known as Electronic Funds Transfer at Point of Sale (EFT-POS) has been introduced experimentally and found acceptable by consumers and businessmen. A pilot scheme carried out in 1982 in Aberdeen, Scotland, indicated that the high cost of installing terminals on a national scale in hotels, gas stations, supermarkets, and de-

EFTS KEYWORDS

DEBIT (OR ACCESS) CARD A magnetically encoded plastic card used to gain access to a terminal in order to make a financial transaction. When this card is used in conjunction with a personal identification number (PIN), the customer is given access to his account(s).

AUTOMATED TELLER MACHINE (ATM) A terminal that gives a customer access to banking transactions normally performed by a bank teller through the use of an access card.

ELECTRONIC FUNDS TRANSFER SYSTEM (EFT OR EFTS) The use of a network of computers in banks, retail stores, and other financial institutions to transfer funds electronically.

FLOAT TIME The time lapse between the writing of a cheque and the debiting of the cheque from an account.

PERSONAL IDENTIFICATION NUMBER (PIN) An identification number determined by the user to gain access to a computer terminal to make a financial transaction.

POINT-OF-SALES TERMINAL (POS) A terminal which allows the customer to have his bank account debited immediately for a purchase.

UNIVERSAL PRODUCT CODE (UPC) A series of lines found on all products to identify a product for pricing and inventory. Used with a scanner, this provides a fast, accurate check-out system in the supermarket.

VIDEOTEX A two-way computer system which allows consumers to shop, make banking transactions, reservations, etc. from their home.

artment stores was considered a north-while investment by the banks since it would halve the current costs of cheque processing.

In the future, the use of home computers and videotex systems such as Telidon, in conjunction with the banks and stores, will allow consumers to conduct their banking and shopping from home. Many stores will list their merchandise in a computer file so that consumers can simply shop by looking at an electronic catalogue. Shoppers will give their credit card number and arrange for delivery of products to their home or the nearest branch of the store.

If these descriptions of both current and future changes make you feel allergic to dealing with a computer, be assured that you are not alone. Many people have expressed their concern over possible misuse of the instant banking cards or debit cards. If someone loses his card, is it at all possible for someone else to use the card? Banks say no, because the card must be used in conjunction with an identifying number (PIN) that only the card user knows.

Another concern is the possible misuse of accounts or error due to lack of personal contact. The use of electronic technology also centralizes financial information, thus allowing access which may be difficult to monitor. Because of this, many people feel that the privacy of the individual may be threatened.

The use of a debit card means instant withdrawal, thus eliminating the time between the writing of a cheque and its clearing the bank. Stop payment orders will also become exact. Consumers must learn new techniques of money management as a result of the use of intangible methods of payment.

It is hoped that these concerns for computer crimes and misuse of information will be alleviated in the next few years as more legislation related to EFTS is introduced. But the real question is: what happens to the consumer's right to choice if all businesses convert from cash to the use of EFTS? Perhaps the answer lies in the putting into practice another consumer right, the right to be heard. It is only through the exercising of these rights that we as consumers can build a better society with the help of microtechnology.

Farm machinery

GOOD VALUE FOR THE \$

(For an article on Professor Eric Norris, Department of Agricultural Engineering, see Prof Profile, page 14. His comments on lawn mowers, snow blowers, and rototillers, may also be found on page 14.)

Steve Olive: *Would you care to comment on the general quality of current production of farm equipment? Is it good, bad, too high priced, too low priced? Are we getting good design, good safety features? Is the farmer getting good value for his money?*

Eric Norris: That quadruple-barrelled question has many answers. The farm machinery industry has — just as any other industry — experienced its long-term and short-term shake downs over the years. The industry has gone from boom to bust on a 15 or 20-year cycle ever since the internal combustion engine or even the steam engine was applied to agricultural power. It is like any other segment of agriculture production. I believe that the agricultural machinery industry does an admirable job of producing the tools of the trade for the farmer given the constraints that it works under. Here are the constraints: It must produce a machine that does a very complex job. Let's take the combine as an example. The machine must take a standing crop of wheat and separate that out into clean grain and straw, discarding the straw and putting the grain into the bin. To do that at 95 per cent performance efficiency is a complex job. The job must be done quickly because the harvest season is short. Therefore, it has to be a high capacity machine and this machine has to do this job for only a very short period of time. This machine has to perform under the worst of all possible conditions — bouncing over a rough field, going through mud holes, hitting rocks, taking the occasional ground hog through it.

The wheat harvesting season is only a few weeks. A custom operator might start down in Texas and work up into Saskatchewan and wear out one machine a year, but basically in our locality one farmer uses his combine for two or three weeks of the year and then puts it away. Finally this machine has to be cheap be-

cause it is working with a product, wheat, that is cheap, and it is doing the job for a short period of time. Any machine, a farm machine or a machine sitting on a factory floor, is going to be obsolete in 10 to 15 years maximum. The combine has to do this complex job for 10 years but for only 100 to 200 hours out of each of those years. Compare the combine to a machine such as a plastic extruder sitting on a factory floor cranking out miles of drain tube. It sits there and does that job 24 hours a day, 365 days a year. It is sitting still, not bouncing over a field, and it probably only costs 10 or 12 times as much as the combine.

In answer to your question I think within the constraints of the problems that are faced, the agricultural machinery companies do a hell of a good job of meeting their objectives. That isn't to say that agricultural machinery doesn't have its reliability problems — machines are going to break down.

Steve Olive: *The shortcomings then are no greater within that field than in any other.*

Eric Norris: I don't think that a tractor is any more unreliable than an automobile or a blender. It certainly meets reasonable standards — it may even surpass them.

Steve Olive: *There is presumably enough competition in the marketplace for the farmer to expect to be able to buy a quality piece of machinery.*

Eric Norris: I would say that \$100,000 for a combine is cheap when compared to factory machines that do less complex jobs. The cost includes labour and development. Companies do not sell that many combines. They are producing a small number of larger and larger machines for a shrinking market of fewer and fewer customers.

William Lochhead and the Quebec Society for the Protection of Plants

by **Ralph H. Estey**
Emeritus Professor
Department of Plant Science

Many readers of the *Journal* will be pleasantly surprised to learn that the oldest society in the world that is devoted to the general protection of plants, and still functioning under its original name, was founded in the old Biology Building of Macdonald College, by Professor William Lochhead.

William Lochhead (1864-1927), who had been recruited by Dr. J.W. Robertson in the fall of 1904 while still on the teaching staff of the Ontario Agricultural College (OAC), came to Ste. Anne de Bellevue, first in 1905, and again in 1906 when he played a major role in some of the early planning of a curriculum and in supervising the construction and the ordering of equipment to be used in the Biology Building of a functioning Macdonald College in 1907. He even supervised the digging of a drainage ditch across the College Farm by a gang of Italian labourers and the construction of a windmill to pump the drainage water over a ridge to be discharged into the Lake of Two Mountains. Having been President of the Ontario Entomological Society and the leading figure in a Nature Study program that was just getting started at the OAC, Lochhead soon saw the need for an organization of scientists and learned amateur biologists in Quebec that could focus the attention of its members and the general public on economically important plants. The entomologists of the day — and he was an outstanding example — tended to study the insects they were collecting and virtually ignore the plants on which the insects may have been feeding. Similarly, the mycologists collected and studied fungi with little regard to what those fungi may have been doing to the trees and other plants to which so many of them were attached or otherwise associated.

Fortunately for Professor Lochhead his concept of a new, plant-oriented society came at the right time and in the right place. A number of leading agriculturists and amateur biologists in

Quebec were receptive to the idea and promptly pledged their support. These included the well-known and respected Rev. Abbe V.A. Huard, editor of *Le Naturalist Canadien*; Rev. Dr. Thomas Fyles, a nationally known entomologist from Levis; Rev. Brother Liguori, a teacher of agriculture at La Trappe; Mr. J.C. Chapais, son of Senator Chapais and one of the most influential agriculturists in Quebec; Mr. Henry H. Lyman, the entomologist after whom the Lyman Entomological Museum and Research Laboratory was named, and many others.

With the support of such men as these, it was not too difficult for Lochhead to get financial assistance from the Government of Quebec, through its Department of Agriculture, to pay the out-of-pocket expenses of all who attended the organizational meeting.

The 15 men who came to the meeting at Macdonald accepted, with only minor modifications, the draft constitution that Lochhead had prepared, elected an interim slate of officers and otherwise inaugurated the Quebec Society for the Protection of Plants (QSPP) during the afternoon and evening of June 24, 1908. That date is significant because a society with somewhat similar although much narrower objectives, The American Phytopathological Society, held its inaugural meeting some six months later in Baltimore, Maryland, December 30, 1908. Societies organized earlier than the QSPP have either changed their names or had intervals of inactivity extending more than one year, thus leaving the QSPP, which has been continuously active for 75 years, as the senior society in its field.

Through successive annual elections, Professor Lochhead was President of the QSPP for the first 28 years of its development. Failing health prevented him from presiding over the meeting of 1925 and he resigned shortly thereafter. Until 1939, the office of the Society was in the Biology Building of Macdonald with members of the teaching staff (Douglas Wier, J.M. Swain, B.T. Dickson, and E.M. DuPorte) acting as its successive

secretaries. Over the years several members of the Macdonald Faculty have been elected President of the QSPP. These, in addition to Lochhead include J.G. Coulson, W.H. Brittain, F.O. Morrison, R.H. Estey, W.E. Sackston, and R.L. Pelletier.

William Lochhead, who was born in Listowel, Ontario, in 1864, came to McGill University for his post-secondary education and graduated with a B.A. degree in 1885. After graduation he held a fellowship in Cornell University, then taught science in the Galt and London Collegiate Institutes, with an interval of one year during which he completed the program of work and study for the M.S. degree of Cornell. On September 15, 1898, he was appointed Professor of Biology and Geology at the Ontario Agricultural College, a position which he retained until he resigned to accept a position at Macdonald College. During his nearly eight-year stint at the OAC, he taught, among other subjects, entomology, mycology, and plant pathology. He also inaugurated a provincial system for the fumigation of nursery stock in 1899 and became Inspector of Fumigation, a position from which he resigned in 1902 so as to devote more time to his teaching and to develop a nature study program for Ontario schools.

When Macdonald College opened its doors to its first students, Lochhead became the first Professor of Biology. Almost at once he introduced innovative courses and areas of research. For example, he gave a course called Biological Theories in which he discussed evolution, heredity, genetics and mutation at a time when the theory of evolution was a touchy topic almost everywhere. He was also one of the first to teach geology as an aspect of soil science basic to agriculture.

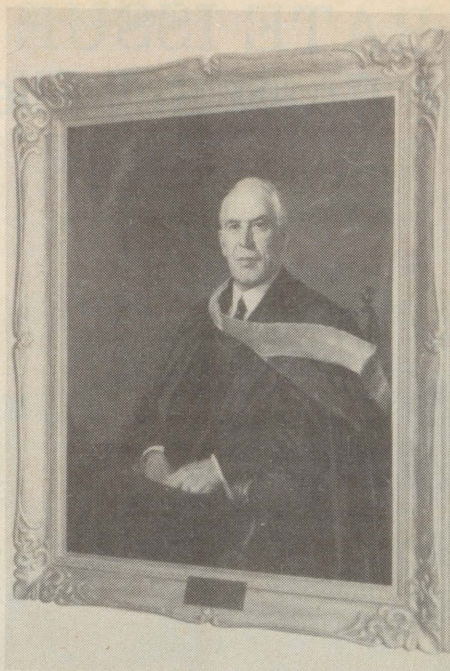
In addition to his responsibilities with the Faculty of Agriculture and the QSPP, Professor Lochhead was Editor of the English edition of the (Quebec) "*Journal of Agriculture and Horticulture*" from 1908 until 1920. His editorials in that *Journal* repeatedly advocated a survey of the soils of Quebec. In this, as with so many of his ad-

anced ideas, he was a harbinger of what was to be considered necessary a few years later.

Professor Lochhead was a leader in organizing the college teaching staff to what became known as the Macdonald College Club — a forerunner of the present-day Faculty Club — of which he was the first president, in 1909. He also played a leading role in the organization of a Biological Club, a club which continued to function long after the Biology Department ceased to exist. From 1912 until 1926, he represented the Faculty of Agriculture and the Corporation of the University as a Faculty Fellow. The Corporation was a body similar in authority to the present Senate. It was during this period that he began insisting that Agriculture be placed on a par with other Faculties of the University. Although this objective was not reached during his lifetime, he did gain greater recognition and respect for the Faculty and thus paved the way for the equality that was eventually won.

In the winter of 1924-25, Professor Lochhead went to Britain, at the expense of the Canadian Pacific Railway, and visited several Public Schools to persuade the boys in those schools to come to Canada, study agriculture at Macdonald College, and settle on farms in this country. Evidence of the success of this venture lies in the fact that over the next few years many boys came, took the Diploma course, and settled on farms or transfer to the degree program prior to making a career in agriculture.

Although Professor Lochhead taught several widely different courses at Macdonald, his most important contributions to science were in the general area of economic entomology; therefore, when the Department of Biology was divided in 1920 into departments of Botany and Entomology-Zoology, he continued as Professor of Entomology and Zoology. He was such a populariser of science and an inspiring teacher that his students and colleagues decided to perpetuate his memory. To ensure this they commissioned Mr. G. Horne Russell, President of the Royal Canadian Academy to paint his portrait. That painting of William Lochhead, which was unveiled by Sir Arthur Currie, March 17, 1926, in the presence of his son Dr. Alan G. Lochhead, a throng of his colleagues, former students, and other friends,



Professor William Lochhead

now hangs on the wall of the Faculty lounge in the Macdonald-Stewart Building.

Incidentally, Dr. Alan G. Lochhead (1890-1980), like his father, was a noteworthy biologist. A B.A. graduate of McGill, he was one of the first to obtain a Masters degree for work done at Macdonald College, in 1912. War broke out while he was studying at Leipzig University and he was interned in Germany 1914-18. Returning to Canada he quickly earned a McGill Ph.D. degree in Agricultural Chemistry and wrote his thesis in German. He lectured in bacteriology at Macdonald for a year and eventually, in 1923, became the Agricultural Bacteriologist for the then Dominion Department of Agriculture.

Although the portrait of William Lochhead will remain as a beautiful memorial for generations of staff and students to see and admire, the QSPP is a far greater memorial to that man of vision and ability. Over the years the Society has provided a unique, bilingual forum for amateur biologists and scientists to discuss virtually every factor that can impede the growth and development of economic plants or the preservation of their harvested products. More than 680 of these discussion papers and results of research were published in the Annual Reports of the QSPP. Many of these Reports, especially the ones published during the Presidency of William Lochhead,

were so well written and had such good illustrations of insects, weeds, weed seeds, and disease-affected plants that they were in demand as reference materials and teaching aids by schools and colleges throughout the country.

In 1962 the Reports were discontinued and replaced by a journal named "*Phytoprotection*" in which the Society publishes refereed scientific papers, in English or French, on every aspect of plant protection, whether it be from birds, insects, weeds, disease inducing organisms, or other unfavourable factors in the environment. The present Editor of *Phytoprotection* is Dr. Claude Richard, Agriculture Canada Research Station, Ste. Foy, Québec.

As a service to all Canadians, the QSPP, with financial support from the Government of Québec, has published four editions of the book, "*French Names of Insects in Canada, with corresponding Latin and English Names*," and two editions of "*French Names of Plant Diseases in Canada with English Equivalents*."

In the field of applied biology the QSPP ranks as a pioneer and through its journal "*Phytoprotection*" is now reaching and influencing far more agriculturists and other biologists than William Lochhead could have imagined. The present executive officers of the Society, Camilien Gagnon, President; Leon Tartier, Secretary; and Alan Devaux, Treasurer, all of whom studied at Macdonald, and obtained advanced degrees from McGill University, can look back on the history of their Society with justifiable pride and to the future with confidence. The QSPP will continue to make a positive impact on the agricultural community, both within and beyond the borders of Quebec, long after it celebrates a century of service, and William Lochhead will always be remembered as its founder.

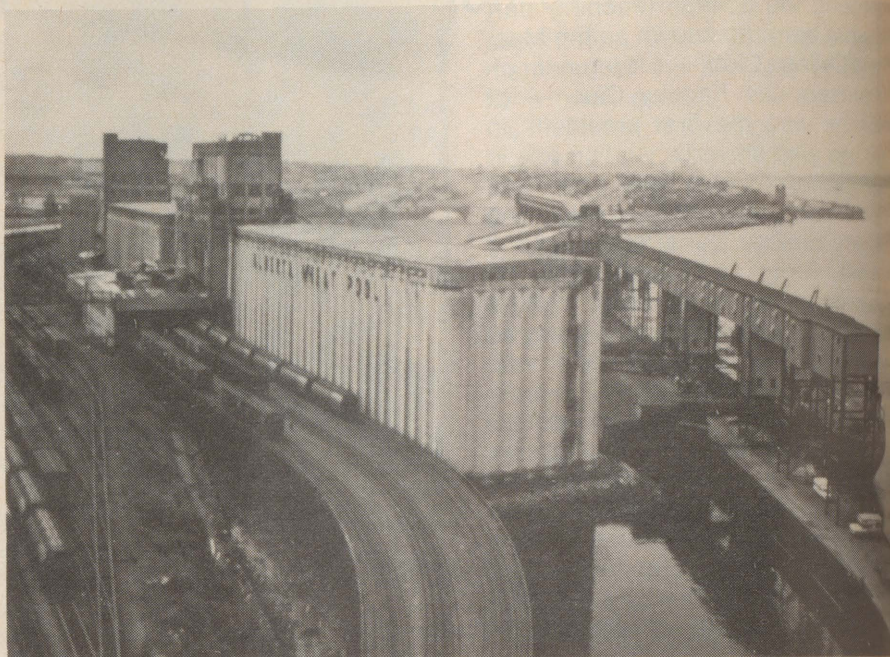
McGill University honoured Lochhead by conferring upon him the title of Emeritus Professor when he retired in 1925. In 1931 Mrs. Lochhead endowed the William Lochhead Memorial Prize in memory of her husband. That prize, which is still being offered each year to the student who fulfills certain requirements, one of which is to have a major interest in entomology, is an annual reminder of an extraordinary teacher-scientist, Professor William Lochhead.

THE CROW RATE ISSUE — PART II

The Crow Still Flies

by Professor H. Garth Coffin
Chairman, Department of
Agricultural Economics

Editors Note: This article was written prior to the announcement of Transport Minister, the Hon. Jean-Luc Pépin on May 4th, indicating changes to the proposed Crow Rate reform. The most important changes are that the federal contribution is to be paid **entirely** to the railway, and the "Agricultural Development Fund" (see 4 below) has been withdrawn. The proposed change in method of payment should satisfy much of the earlier concern in eastern Canada.



In the first part of this two-part article appearing in the last issue (see: "The Crow Flies East" Macdonald Journal, Feb. 1983), the background of the Crow Rate was discussed briefly along with the major changes recommended by agricultural economist Dr. Clay Gilson and the concerns of some groups over the impact of those changes on agriculture in eastern Canada. In the second and final part, we will look at the changes actually proposed in the federal government announcement and consider the implications which are prompting opposition from organizations such as the Canadian Federation of Agriculture, the Government of Saskatchewan and the "Coalition for the Survival of the Agri-Food Industry in Quebec." Certain aspects of the federal proposal and the response of these groups to it appear to be ensuring that "the Crow still flies," which explains the choice of title for this article.

The Federal Government Proposal

The proposed changes announced by the Hon. Jean-Luc Pépin on February 1st follow closely those recommended by Dr. Clay Gilson in his report to the federal government in June 1982. It will be recalled that Gilson was commissioned in February last year to find a consensus solution to the problems caused by the Crow Rate structure within

western Canada. In fact, the Pépin plan adopts, in large measure, 11 of the major recommendations made by Gilson. The most important elements of the Pépin plan for Crow reform are summarized below:

1) **The Crow Benefit** The federal government will assume responsibility for a "Crow benefit" of \$651.6 million per year in perpetuity as a measure of the current value of the statutory freight rates to western grain producers. This amount is based on an estimate of railway losses on the movement of 31.1 million tonnes of western grains in 1981-82. The federal commitment will be further increased by the excess of any annual freight rate increase over three per cent for the first four years and six per cent thereafter, as related to the base volume of 31.1 million tonnes of grain.

2) **Method of Payment** This "Crow-Benefit" subsidy will be paid totally to the railways in 1982-83 but progressively divided between the railways and grain producers in succeeding years, reaching a proportion of 50-50 in 1985-86. Further adjustments beyond that proportion of payment directly to producers versus the railways will require new par-

liamentary approval at that time, based on a review of experience with the plan up to that point. The impact of this arrangement on agriculture in eastern Canada will be monitored by the Livestock Feed Board of Canada.

3) **Eligible Products** The list of products eligible for the statutory freight rates will be extended to include canola oil and meal and linseed oil and meal, enabling these products to be moved at the same freight rate as the raw seed.

4) **Agricultural Development Initiatives and Adjustment Fund** The federal government will provide \$175 million over a five-year period to stimulate agricultural development throughout the country. Under the program, funds will be made available for assistance with activities such as land improvement, feed grain storage, handling and drying capacity, conservation measures, and technological developments, including electronic marketing. The package is in addition to the \$200 million Agricultural Adjustment Payments for western grain producers as compensation for extending the Crow benefits to other crops and grains used within the Prairies, as recommended by Gilson.

Other elements The federal proposal for Crow reform includes a number of other elements such as creation of a new grain transportation agency, the purchase of additional hopper cars, investment and performance commitments of the railways, industrial development initiatives, and branch line rehabilitation. Most of these will form part of the new legislative package expected to be introduced in the next session of Parliament.

Implications

The first implication of the multifaceted Crow reform proposal of the federal government is the financial commitment it entails. That commitment is estimated to represent \$3.7 billion up to 1985-86 with the breakdown as illustrated in Table 1. This amount is considered to be nearly three times the level of financial commitment of the federal government to western grain transportation

in the absence of Crow reform and represents the price offered by the federal government to bring western grain interests to the negotiating table. Based on approximately 140 thousand Canadian Wheat Board permit holders, that amount represents some \$26 thousand per grain producer in western Canada over the next four years.

It must be emphasized, of course, that grain producers will not see most of that money. In fact, they will receive, only about one-quarter of the total amount, or roughly \$900 million up to 1985-86. Most of the balance will be paid directly to the railways or invested in new hopper cars. In any case, the size of the current federal commitment has prompted some groups to recommend that it be frozen or "capped" at a specified level rather than left open ended for future increases.

Despite the relatively small proportion of the **total** federal expenditure going directly to grain producers, it is the **method of payment** of the "Crow Benefit" that is at the heart of the current controversy, both east and west. This method of payment, whereby 50 per cent of the Crow Benefit would be paid directly to grain producers by 1985-86 on the basis of crop acreage is, therefore, the second major implication to consider.

The proposed method of payment, allowing freight rates to rise towards compensatory levels, and simultaneously compensating grain producers accordingly, was recommended by Gilson in order to minimize the effect of subsidized freight rates on production and marketing decisions in western Canada. Western grain producer interests are opposed to this approach, however, on the grounds that it transforms a transportation policy into a more visible regional production subsidy, thereby making it more vulnerable to public pressure for complete withdrawal in the future. Agricultural spokesmen in eastern Canada are also concerned that subsidy payment to producers may be used to expand livestock production in western Canada in order to take greater advantage of relatively cheaper feed grains in that region and increase competition with eastern producers for available markets. In effect then, the majority of producers in both parts of the country

Table 1. Estimated federal government expenditures on western grain transportation under the proposed Crow reform package, 1982-83 to 1985-86.

ITEM	AMOUNT
	(million)
Crow Benefit Payments ^a	\$2,267.8
Federal Share of Rate Increases	146.0
Agricultural Adjustment Payments	204.0
Branch Line Rehabilitation and Operation	658.2
Hopper Car Purchase and Lease	434.3
Administration	5.7
TOTAL	\$3,716.0 million

^a Includes an interim payment of \$313 million in 1982-83 and \$651.6 million for each of the next three years.

Table 2. Transportation and handling costs and projections for moving barley from Saskatoon to Granby, Quebec.

	1977 (November)	1980 (June)	1983 (February)	1986 ^a (February)
	(dollars per tonne)			
Primary elevation	5.26	6.45	7.46	8.88
Freight to Thunder Bay	4.85	4.85	4.85	19.56 ^b
Total:				
Saskatoon to Thunder Bay	10.11	11.30	12.31	28.44
Terminal handling at Thunder Bay	3.22	4.27	4.95	5.89
Freight to Montreal	8.91	15.18	20.10	23.92
Total:				
Thunder Bay to Montreal	12.13	19.45	25.05	29.81
Forward elevation at Montreal	3.71	2.22	3.55	4.22
Freight to Granby	4.85	5.40	6.90	8.21
Total: Montreal to Granby	8.56	7.62	10.45	12.43
Feed Freight Assistance	-2.20	-2.20	-2.20	-2.20(?)
TOTAL:				
Saskatoon to Granby	28.60	36.17	45.61	68.48

^a Estimates based on federal government projections for Prairie freight rate, and a six per cent annual adjustment of 1983 values of all other components.

^b Partial compensation for the increased freight rates, western producers will receive direct payments equivalent to \$10.21 per tonne regardless of where they sell or dispose of their grain.

are opposed to the transformation of a regional **transportation** subsidy, currently financed by the railways, into a regional **production** subsidy financed by the federal government. It should be noted, however, that both groups agree that the federal government should assume responsibility for railway losses on this movement but that payments should be made directly to the railways.

To see more clearly the impact of proposed changes on grain transportation costs for the movement of western grain within Canada, these costs are profiled in Table 2 by component for four different periods, including one projection to 1986. Under the federal proposal the rail freight rate from Saskatoon to Thunder Bay in this example would increase from \$4.85 per tonne at present to \$19.56 per tonne in 1986. But with the Crow-Benefit and Agricultural Adjustment Payments, the western grain producer would receive acreage payments representing the equivalent of \$10.21 per tonne whether he ships his grain to Thunder Bay, sells it to a neighbour, or feeds it to his own livestock.

The projected increase in total costs of the movement of barley from Saskatoon to Granby amounts to roughly \$7.60 per tonne over each of the next three years, compared to approximately \$3.20 per tonne over each of the past five years with the Crow Rate constant. It must be emphasized, however, that higher transportation costs in western Canada do **not** necessarily mean higher grain prices in eastern Canada. This is because the price of United States corn generally sets the ceiling on grain prices in eastern Canada and prices of western grain must adjust to that level. Therefore, any increase in transportation costs in western Canada must be reflected through lower prices received by grain producers in that region. The net total transport costs in Table 2 are fairly typical for shipment of western barley to many other points in Quebec and Ontario.

The implications of the development initiatives and adjustment payments (item 4) are difficult to assess at this point because they are so broad and general. Although all parts of the country are eligible for most of the development initiative

funds, it has been indicated that Quebec is expected to qualify for \$93 million, out of the total of \$175 committed to these programs. Many of the initiatives that may be supported under this program have merit in their own right, but they have little or nothing to do with the Crow rate reform per se. Rather, this program is offered as compensation by the federal government in recognition that there will be some impact of Crow reform in eastern Canada.

Impact on Livestock and Poultry Production

What, then, will be the impact on livestock and poultry production? As pointed out in Part I of this article (see previous issue), the main effect will be on the competitive position of livestock production in different regions of the country, through lower relative feeding costs in western Canada.

Taken by themselves, the impact of the proposed Crow Rate changes on feeding costs appear modest and gradual, especially for dairy and poultry products which require a relatively small volume of grain per unit of output. Moreover, regional production patterns for these commodities are generally stabilized, at least in the short term, by production quotas.

Such is not the case in hog production where the Crow adjustment represents a feed cost saving of some \$5 per market hog relative to eastern Canada by 1985-86. When added to recently estimated regional differences in gross returns over feeding costs (see previous issue), the difference in gross margin between Quebec and western Canada would increase to approximately \$17 per market hog. Under the Gilson proposal, the gain in competitive advantage from Crow reform alone would amount to \$13 per market hog by 1990.

Similarly with beef production, Agriculture Canada has estimated that the gain in competitive advantage in western Canada would amount to \$4.60 per hundredweight of dressed carcass. This is expected to stimulate fed beef production in western Canada so that there may be fewer feeder cattle available for finishing in other parts of the country.

The impact of these developments on eastern Canada depends, in part, on the extent to which western producers respond to these new incentives and, in part, on international trade relations, particularly with the U.S. In the past, the expansion of livestock production in western Canada has been more as a means to market surplus grain than for profitability in livestock per se. To the extent that this tendency persists, improved efficiency of the transportation system leading to less frequent surpluses may be a disincentive to livestock expansion in western Canada.

Even if livestock expansion does occur in western Canada, and most analysts agree that it will, it may not be very damaging to the existing production of these commodities in eastern Canada as long as trade channels remain open, particularly with the U.S. and Japan. However, if one or both of these outlets for Canadian pork was closed down or reduced, even temporarily, the impact on pork producers in eastern Canada would be much more severe than in the West, regardless of meat transportation costs within this country. One important feature of trade relations with the U.S. in the beef sector is that more of eastern Canada's requirements for feeder cattle will likely come from the southeastern U.S. to replace part of the current supply from western Canada.

Regardless of the impact on existing production of beef and pork in eastern Canada, the expansion of production in western Canada by up to \$1 billion, expected by the federal government by 1990, is likely to mean slower growth in these products for eastern Canada. This is essentially the conclusion reached by forecasters at Chase Econometrics when they analyzed the impact of the Gilson recommendations among other factors. Their forecast of annual average growth rates for beef and pork over the next 10 years (as reported in *Feedstuffs* last November) is summarized in Table 3. In addition, this source also predicts a west to east movement of some four million pounds of pork by 1984 and 20 million by 1990 versus practically none at present.

In conclusion, then, the transformation of the Crow Rate from a

3. Average annual growth rates for red meat production in Canada with projections to

Pork		Beef	
1971-81	1982-92	1971-81	1982-92
(Per Cent)			
-2.5	3.4	1.8	2.4
6.8	1.1	2.0	1.9
3.9	1.8	1.9	2.0

Source: "Pork, Beef Output To Grow In Western Canada During Next Decade: Chase Econometrics." *Feedstuffs*, November 25, 1982.

y "privately funded" (through rail es) transportation subsidy to a licly funded, primarily regional duction subsidy is bound to have

some impact on agriculture in all parts of the country. There are still many questions to be answered about that impact and a large part of

the farming community in Canada is not convinced that the current federal proposal is the best solution. Given the measure of opposition to the proposal, and the need to have new legislation passed in parliament before the proposed revisions take effect, there may still be a few flaps left in the "old Crow" before the "new Crow" flies in to take its place. The magnitude of the proposed reform and its importance to Canadian agriculture require that policy makers be very sure about the "nest" which they and the nation's farmers will occupy, together with the "new Crow," for the years to come.

S.

Take Advantage of H. Gordon

ieves me to no end that a college publication, such as the Macdonald Journal, should take unfair advantage of any person. In particular, I you took advantage of Mr. H. Gordon.

his poor man is obviously very pressed for time, yet he unashly gave of his time to contribute the Journal. Proof of his severe of time abounds throughout his le in the February Journal.

r. Green is one of our poor beef ucers labouring under govern- bureaucracy while attempting oduce beef. Obviously, if he had time, he would make every at- possible to use well-balanced ns, genetically superior bulls, selection indexes, and average gain and feed efficiency calcula- to become an efficient pro-

r. However, since his time is so ed he must fight a vicious circle. cannot get his cows bred until Ju- resume because he must spend fixing fences for his bull and cannot detect heat in his cows g this period. He obviously n't have time to browse through A.I. catalogue and see the su- or genetic resources available to producers. Thus, poor Mr. Green rely on that old bull of his — we hope is fertile and not a tic time bomb — to breed the

cows during those lonely July nights. Since these breedings are delayed in- to the haying season, he cannot use a chin-ball marker on his bull because he wouldn't have the time to look at the cows, once a day, and record any "love making" that may have taken place. This also results in him not knowing when his cows are due to calf and, therefore, he cannot provide them with a nice clean and dry calving area. His lack of time also results in him not being able to assist cows having a difficult birth; thank Heaven that simple births need no assistance (or observers). By the time Mr. Green is able to see his new-born calves they are romping through his fields, uncatchable, and unweighable. The end result of his lack of time is that these calves, whether born in March or June, must be weaned off their mothers in the fall whether they weigh 100 kg or 300 kg.

This man has sacrificed the genetic and economic viability of his beef herd in order to help the Journal. No wonder his cows feel he is a stranger among them whose ribs must be broken — in self-defense, of course.

In return for his contribution to the Journal, I trust you will pass along the following information to him, since he appeared to be looking for an answer. The cattle I own get up frontend-arsendto first.

Stuart Bowman
Director, Farm Practice
Diploma in Agriculture Program

Full of Interest

Please enter my subscription to the Journal . . . I found the February '83

issue full of interest from the embryo transfer to Gordon Green to the Arboretum. The Campus items are also of interest.

R. Flood, Dip. 31, B.S.A. '35
Waterloo, Que.

Keep in Touch

Since I never get back to Mac now this subscription will help me to keep in touch. I attended a short course in the winter of '27, entered the Diploma course and graduated in the spring of '29. Everything has changed now, including ourselves!

Reginald G. Conner
North Hatley, Que.

An Excellent Issue

Congratulations on an excellent issue of the November Macdonald Journal. You really packed it full of good information.

I should have taken a look at it earlier but I have been kind of busy with new responsibilities. Let's hope you can continue to publish as big a volume as the November issue in the future. Keep up the good work and all the best to you.

A.O. Terauds, P. Ag. (B.Sc. [Agr.] '75)
General Manager
Agriculture Institute of Canada

Keep it Up

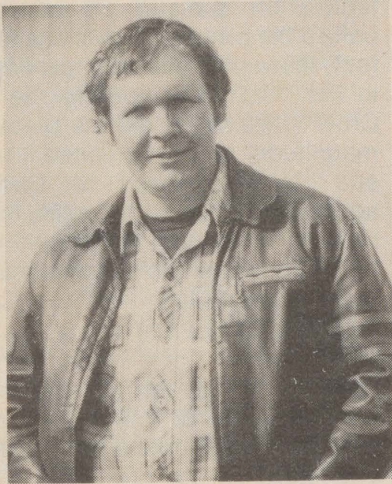
We at Purina enjoy your publication very much, keep up the good work.

Ken Witt
Ralston Purina
Longueuil, Que.

DIPLOMA

by Jim Currie
Assistant Director, Farm Practice

C
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What a day to chose to drive to Shawville! Beautiful sunshine, spring in the air, and St. Patrick's Day. What could be nicer than to drive from Mac to Shawville listening to CFRA playing Irish music and telling limericks. Some folks might volunteer dog-sledding from Churchill to Resolute Bay in a blizzard, but let's ignore remarks like that. In any event, I arrived at the Judd farm a slight shade of nationalist green and forever a groupie of the Irish Rovers.

Rare is the Diploma class at Mac that doesn't have at least one representative from Pontiac county. The years Chris Judd was here saw four of them. Besides Chris, there was Terry Davies, now with Consolidated Bathurst Paper Mills, Gary Richardson with Shur-Gain in Toronto, and Steve Griffin from Calumet Island.

Considering the boisterous characteristics of many of the Diploma students from Pontiac, it is not hard to imagine that with four, this class must have been lively. Along with boisterousness, you usually find drive and ambition. I've met many from that class, and they've sure displayed an abundance of the latter. So why select one in particular? Because the accomplishments of all would fill a book.

Chris Judd is one of the grads who returned to the home farm. His goal in coming to Mac was to gain technology and contacts that would make him a better farmer. This would appear to be an on-going project since I

have seldom met a person who is more up on modern technology nor someone who places such importance on personal contact. By his own admission, Chris thinks nothing of spending a day driving from farm to farm to see how a piece of equipment or a system works for someone else. And why not? As Chris says, if he's spending thousands of dollars, he wants to know it's a good investment. He'll readily admit to making mistakes, but at least this way he can take credit for them instead of passing them on to some salesman's sharp talk.

As with all Dip students, Chris Judd produced a farm project. He still has it, and it would rate quite well even today. However, what was to be a five-year project has stretched to 15 and still isn't completed. This doesn't mean he's slow; he just showed a common trait of Dip students — over expectation. Things take longer in real life than on paper.

When Chris returned from Mac to take over the family farm in 1968 it was already a going concern. At that time it consisted of about 30 Holstein milk cows producing over 333,000 pounds of milk — on an 11,000 pounds average. After 15 years, he is producing over 1,100,000 pounds of milk on 78 cows.

His composite BCA stands at about 132; with better luck in 1983, this should rise somewhat. Credit for this production he feels goes to improved breeding and better feeding. The first is from better bull selection through A.I.; the second he feels is from better crops available for his area and better storage facilities.

The original 425 acres that made up the Judd farm in 1968 were fine for the time but not for today. Even with the improvements made through better crops and fertility, Chris found he needed more land. He rents 100 acres and leases another 100 acres. This allows him to grow 185 acres for corn, 110 acres for pasture, and the rest for alfalfa. Only about 65 acres is not tillable. His main problem is the variability of the soils on the farm and adjusting crops and fertilizer to match. Most of his land is sandy, but

it varies from loam to clay. Depending on the year this often causes variations in his crop yields. He stores his corn as silage or as high-moisture corn. His alfalfa is put up as haylage. He is satisfied that he can justify his two sealed silos by using them for haylage and high moisture corn. Chris is one of the few farmers in his area to have gone to this system and no doubt he takes his share of criticism for it. Part of his reasoning was to maintain the quality of feed he puts in, the other part was to give him more automation. He put a lot of emphasis on this as he doesn't want to spend all his time in the barn. He wants his system set up so that his hired helpers can take care of it while he is away at meetings or other events.

Part of Chris Judd's lifestyle is to be involved in various organizations. He seems to have a genuine concern for his community and the well-being of agriculture in it. That's how he came to be (among other things) Provincial Area Director of the Q.F.A.; President of the local syndicate of U.P.A., including the English syndicate; on the board of directors of the local Mutual Fire Insurance; in the Kinsman Council on the Q.F.A./CBC advisory committee; sells seed corn, and is married with a young family. If you think this is a lot, he'll tell you it is "because of the last two that he does for others." Chris wants his family secure and his farm set up well enough so that his children will want to take over from him. By helping in the community, working for agriculture, and making contacts he hopes to achieve his goal. What else does he want? Well, for the farm he wants to go to a total mixed ration, extend his barns, build a house a larger herd, and get the whole system on his minicomputer. With his interest in records, he'll need it.

There are many other things that could be said about Chris Judd. I'm not writing a book! I thoroughly enjoyed the day I spent with Chris and we're proud that he is a Diploma grad.

Among many Dip grads in the Pontiac area are: Ronald MacKechnie, George Pirie, '55 — Erwin Hayes, '51, Ken Kilgour, '62, Barry Smith, '69, Rick Young, '81, and Mark Thompson, Patti Flanagan, Drummond, Darwin Smith, all '82.

Problems and Strategies During Tough Farm Times

**Michael Katz, Agronome, and
Marcel J. Couture
Marketing Director
Diploma in Agriculture Program**

"It's tough to pencil a profit now," says
t Moncrieff, senior agricultural
anager for the Bank of Montreal.
By almost any indicator, farmers are
rting. The most recent Agriculture
nada estimate of 1982 farm income
t receipts no higher than 1981's,
illing an increase in expenses of
ee per cent for a drop in realized net
m income of nine per cent to \$3.8
lion. Worse, 1983 realized net farm
ome is also forecast to decline
ghtly, to \$3.7 billion.

More ominously, the farm bankrupt-
rate is rising steadily. Quebec farm
nkruptcies jumped to 123 to the end
October 1982, from only 54 in all of
81 and 44 in all of 1980. And
nkruptcies, of course, are only the
of the iceberg.

The Canadian farmer has always
d confidence in his ability as a pro-
ction manager and a firm belief that
economic system was fair enough
efficient enough to reward his hard
rk with a fair return. The confidence
well-placed. But how reliable is the
ief?

Every trend of the 1970s has revers-
itself. The evolution of Western
nomies has run into a fundamen-
interruption in its trajectory of ex-
ension. The strong Canadian dollar of
70s began its plummet in 1980.
sy money tightened up under the in-
ence of skyrocketing interest rates,
inking cash flow from weakening
mmodity prices, and the steady
ce-cost squeeze of steadily inflating
ut costs. Land values are sliding. In-
ion itself, which many farmers had
unted on to fuel steady increases in
d and commodity prices, is wilting
der the steady intensity of high
ted States and Canadian interest
es. Fortunately, in Canada, the
ather and yields have stayed
sitive, unlike the situation in
ustralia where even the rains have
ed up.

There is a lesson in the increasing
atility of markets, in the vulnerabili-

ty of agricultural producers to high in-
terest rates and cost inflation, and in
the increasingly tight profit margins.
The lesson is that success flows from
careful attention to the dollars you take
in and the dollars you put out, as much
as to how high your cows test or what
your yield is per hectare.

"Making money in farming boils
down to one thing," according to Dr.
C.N. Langemeier, an agricultural
economist at Kansas State University.
"That is management; the ability to
manage costs and marketing."

What Dr. Langemeier is emphasizing
is that a successful manager pays
attention to **all four** components of the
profit equation:

$$\text{Profit} = [(\text{Price} \times \text{Output}) - (\text{Cost} \times \text{Input})]$$

This means that the pricing, marketing,
and purchasing strategies of the
operation carry as much weight as the
efficiency of the operation and the ef-
fectiveness of the farm organization.

However, what many farmers fail to
realize is that successful management
is a double-track affair. Thick black ink
on the bottom line at the end of the
year is only one-half of the goal of a
successful strategy. The business
must generate a cash flow adequate
to meet the regular debt commitments
and operating and overhead expenses.

It is safe to say that the fundamen-
tal nature of the current crisis in
agriculture is that it is largely a crisis
of cash flow. This is unlike previous
crises, which were largely concerned
with low and uncertain farm incomes.
It is important to understand how a
positive cash flow differs from a
positive net income: cash flow includes
cash inflows which are not revenues
such as loans, cash outflows which are
not expenses such as repayments on
principal, and it ignores non cash ex-
penses such as depreciation.

The value of the cash flow state-
ment and the cash flow projection is
that these highlight the impact of the
farmers' financing and growth
strategies, as well as the impact of the
operating, purchasing, and marketing
strategies. Although the financing and

growth strategies are important in
defining costs and returns in the in-
come statement, they assume critical
importance in the cash flow analysis
in defining the schedule and burden of
cash payments and the availability of
cash to make these payments.

Ironically, it is those farmers who
pursued what was probably the most
successful management strategy in
the 70s who are leading the stats
downward: those who expanded their
operations by borrowing heavily and
riding a wave of inflation and expand-
ing world demand. Farmers who in-
vested heavily undertook depressing-
ly heavy regular payments and
became vulnerable to inflated interest
rates, cost inflation, and the erratic
flow of income from single final pro-
ducts, be it beef, crops, or hogs.

Are there options for farmers, even
for those in deep? Yes. Turn around
and success are possible and a fact of
life for many operators. The options
can be discussed in the context of the
principal farm strategies:

1. **Pricing:** Establish a pricing plan,
based on your COP (cost of produc-
tion) of each crop or animal unit, which
will tell you when to get in and when
to get out. As one successful farmer
put it: "Don't be afraid to sell on the
way up. Establish some price goals
and stick with them."

2. **Marketing:** This means timing
and storage. One successful operator
recommends: "lock in expenses when
prices are at little more than
breakeven, then watch for peaks to
price the remainder." According to
one survey, 40 per cent of top farmers
establish their price when prices pro-
vide a reasonable return over produc-
tion costs, and only 20 per cent sell ac-
cording to cash flow needs or space
out sales to obtain the seasonal
average price. Marketing strategy also
calls for careful evaluation of the gains
and costs from storing your crop, in-
cluding the interest costs on the sunk
inventory.

3. **Purchasing:** try renting or
custom hiring instead of buying land
and equipment. One successful farm
operator, who is only 24 years old, has
cut his machinery costs in half by go-

ing for second-hand machinery in a big way. Postpone non essential purchases. And what about purchasing dollars? Shop around for the best interest rates. Spread your purchases and sales to improve cash flow.

Generally, as one Bank of Montreal manager put it, price and shop for profit. Base your actions on your careful evaluation of the margin you need on inputs and outputs to lock in positive net income. Use forward purchasing as well as contracting. Good purchasing starts with good COP records.

4. **Efficiency:** The increase of income without increasing expenses!

5. **Effectiveness:** Optimal farm organization starts with budgets of the individual farm enterprises based on COP records. Cut the least profitable part of the operation; this will generally cut expenses more than income. Sell non essential assets and maintain inventories at minimum practical levels. One beef operator, who found himself with a losing feedlot operation, switched into breeding and shut his feedlot. As one analyst put it, liquidation is a

tough word to swallow, but remember, we're talking survival.

6. **Financing:** Again, this starts with good records. Clarify your real profitability with an income statement, a balance sheet, a cash flow statement, and projection. These statements and projections will show you if you are meeting your production targets and pinpoint the likely problems and opportunities to reshape your strategies.

Begin by finding the critical level of financing you can carry, which is the maximum amount you can afford to expend on servicing the debt. Then the key is to stay below this maximum, to maintain a buffer against volatile interest rates and increasing expenses.

7. **Expansion:** This can increase income per unit by cutting average cost per unit, due to economies of scale in purchasing, due to specialization of labour and equipment, and to increasing efficiency. But the peril of expansion is that overexpansion may generate inefficiencies which may escape detection and actually increase average cost per unit. The late

Noah Hadley, formerly Professor of agricultural economics in the U.S., emphasized that before you expand, you have to have your costs under control to the point where you have a satisfactory profit margin. Land purchases are a good long-term investment but may be difficult to cash-flow in the short run.

Probably the key to ensuring success is again from Professor Hadley: "The best farmers I know are always students. They're constantly studying the economic climate, markets, and new technology. Every minute their minds are trying to grasp new ideas. They seem to have the kind of built-in strainer in their mind that latches on to good ideas and lets others go through without paying much attention to them. I guess that's judgment."

"It always falls back on the farm operator to make the judgment of what will really work for him. And he must make that judgment based on partial information. If he waits until the evidence is in, everyone will be there ahead of him."

AGRICULTURAL WEATHER SERVICES

by Professor R.H. Douglas
Department of Agricultural
Chemistry and Physics

There is considerable farm-weather information available to the Quebec production agriculturist. Much of it is provided on a daily basis via the media (radio and television), but a great deal extra is issued via the district offices of the Ministry of Agriculture.

The farm-weather forecast is an extension of the regular forecast issued to the general public. In addition to the predictions of general weather conditions, temperatures, precipitation and its probability, projected through today and tomorrow, the farm broadcast includes wind direction and speed, drying index, heat units (degree-days), and a general outlook for days three to five. Some radio stations carry a public forecast live from the forecast office; while not directly tailored to agricultural needs, such broadcasts often include a brief discussion of the general overall weather-map situation which may be useful to the farmer who has a

rudimentary knowledge of pressure-patterns and of weather-making situations. Even better, of course, is a good TV presentation showing the weather-map features which are expected to dominate the area during the next day or so; the best presentations include satellite pictures.

A recent addition to the farm broadcast network is Weatheradio, on which up-to-the-minute information is broadcast continuously from Montreal and from Quebec City (frequency 162.55 MHz).

In addition, hazard indices related to insect pests, plant disease, and the like are prepared and provided to the district agricultural offices, as is also a complete farm-weather bulletin. Monthly weather summaries (also provided to the agricultural offices) include day-by-day maximum and minimum temperatures, daily precipitation, daily and accumulated degree days and corn heat units. Similar summaries are made up on a weekly and a monthly basis by the Canada Climate Centre (Environment Canada) under the title, "*Climate Perspectives*" (in French or English).

In some areas, where and when a special weather-related problem exists, a code-a-phone service may be installed for directly-dialed information, warnings, or advisories. Specific details of such services can be obtained from the district agricultural office, or from the Quebec Regional Office, Atmospheric Environment Service, 100 boul. Alexis Nihon, Ville St. Laurent H4M 2N6. These various services are a cooperative effort of the provincial and federal meteorological and agricultural agencies and are described in a free booklet entitled "*Canada's Farm Weather Service*," a bilingual publication issued jointly by Agriculture Canada, Environment Canada, and the Canadian Federation of Agriculture; copies are available from the office of the Directeur, Service de l'information Agriculture Québec, 200 chemin Ste. Foy, Québec G1R 4X6.

In making effective use of the daily forecasts, especially in the growing season when cloud and precipitation is essentially convective (i.e. showery), it is important to understand the terminology used. Remember

that the forecast is for a region, not for your specific farm. The meteorologist analyses the weather on a very large scale, based on the weather map on which the reporting stations are often quite far apart; fine-scale analysis is not possible (except in special small-scale research projects, when closely-spaced stations may be installed on a short-term basis). The forecaster can identify a showery or thundery situation over a region, but there is at present no way of predicting such showers as may develop at a particular position. Where weather-radar exists (as in Montreal), summer showers and storms, once formed, can be detected and tracked, and short-term forecasts or warnings issued. Otherwise, with a showery day forecast, one must assume a random occurrence, and depend on one's "eyeball-ear" (which is a well-developed sixth sense for most farmers).

The terminology used is a reflection of the naturally erratic behaviour of summer cloud and precipitation. "Isolated" (or a few) late afternoon or evening showers or thunderstorms" indicates that some showers and/or thunderstorms are expected but will not be widespread; they are certainly not expected to occur everywhere. In most of the areas one can expect no rain, some places can expect a light drizzle, and a few could receive locally heavy showers and substantial rainfall. "Chance of a shower" carries a similar implication. "Widespread showers" (or rain or snow) suggests that most (but not all) areas will be affected. "A few showers" suggests that very little activity is expected, generally spotty and of little consequence.

"Clear" or "sunny" indicates a forecast of less than about two tenths; "sunny with cloudy periods" suggests on the average a sky less than one-half covered, but occasionally more. "Partly cloudy," or "variable cloudiness," is usually used to indicate about half the sky covered or for changing sky conditions. "Overcast," of course, means complete cloud cover most of the day. "Fair" may be used for some cloudiness but no precipitation. "Rain" (or snow) is used to denote organized and often extensive areas of precipitation (in contrast to local showers).

Statistics Supply

In addition to the information mentioned above (which relates to the most immediate weather), there is a vast supply of statistics on weather and climate, and many studies of these data have been published which are of use to agriculture and to forestry. For example, tables are available of the frost-risk in spring and fall expressed in terms of the statistical probability of temperatures below various critical levels. Similar tables are available of degree-days and of corn heat units, accumulated progressively through the growing season, with probabilities of various accumulations by various dates. Agrometeorologists and climatologists are finding more and more useful applications of the many years' data, and are continually looking for more. A good example is a comprehensive analysis and tabulation of *"Spring Field Workday Probabilities for Selected Sites Across Canada"* (published by Agriculture Canada). Having established the weather requirements for a suitable workday, tables were assembled listing the probabilities of such days, throughout the growing season; these tables even take into account, in a general way, the soil type.

Such climatological studies do not replace the day-by-day forecasts but do provide a guide to certain factors useful in the general planning and management function. In many cases the data are displayed on a map, providing a useful overview of a region

(Continued from Page 10)

If a pest population increases to the point where beneficial insects or hand-picking cannot control it, more drastic measures need to be taken. Some pests such as aphids can often be washed off the plant by a strong jet of water. There are also a number of relatively safe pesticides to which the gardener can turn. *Bacillus thuringiensis*, commonly sold under the names DIPEL or THURICIDE, is a microbial pesticide that is specific to caterpillars (e.g., imported cabbage worm, codling moth, tent-caterpillar, gypsy moth, etc.) and so does not harm beneficial organisms, including humans. Insecticidal soaps are effective against aphids, mealybugs,

with respect to the suitability or otherwise of various areas for agricultural use. Space does not permit a list of the multitude of such publications and maps; the interested agriculturist is invited to make inquiry of the appropriate sources: the Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario M3H 5T4; Canada Agriculture, and the Service de l'information, Agriculture Québec, mentioned earlier.

The provision of such services has been a preoccupation of the Expert Committee on Agrometeorology, a national body of agrometeorologists and agriculturists from across Canada. Related to this central committee are a number of regional and provincial committees, each concerned with the specific problems and needs of a particular agricultural region. It is to these committees that weather-related problems are referred, and from which recommendations are made to the appropriate level of government, which establish research priorities and funding. The committees seek and welcome farmer input — not only to raise the important problems but also to assist in the solutions from the vantage point of the man-on-site. Each problem requires its own particular solution. The problem must be identified and the role of weather determined, usually by research in government or university laboratories. Having determined the weather-sensitivity of the problem, then and only then can suitable ameliorative procedures be investigated, designed, tested, and fed into the total agricultural system.

spider mites, and a number of other pests and are safe to use. Diatomaceous earth is a safe but non-specific pesticide that scratches off the waxy coating that protects insects from dehydration; it will harm most beneficial insects (but, fortunately, not bees), so use it sparingly, treating only the affected plant or plant part. Rotenone and pyrethrum are two effective, non-specific insecticides that are *relatively* safe to use. Rotenone should be used with particular care if you are near water as it is very toxic to fish.

In summation, the advantage of a preventive approach to garden pest control, such as has been described in this article, is its permanence.

The European Earwig

by **Professor V.R. Vickery**
Department of Entomology

This insect, though called "European Earwig," is now cosmopolitan in cooler parts of the world as it has been dispersed very widely, though accidentally, by commercial traffic. It is now well established at most seaports from Newfoundland to British Columbia, as well as a number of inland localities in Quebec, Ontario, and Saskatchewan.

In places where it has been established for many years, it is not considered to be a pest species. Earwigs are normally omnivorous, feeding upon both plant and animal materials but are largely beneficial as other insects make up a large part of their food supply.

The situation is quite different in areas where the earwig has recently been introduced. Invariably a population explosion occurs. Earwigs become so numerous that there is not enough insect food to sustain them, and they feed primarily on plants, frequently causing significant damage. The blooms in flower gardens, especially asters or dahlias, may be severely damaged. Although earwigs usually prefer dark areas and are mainly active at night, they may be carried into houses on cut flowers. They are able to squeeze through rather small cracks and, when very numerous, may get into houses from July to September. They cause no damage in houses but their presence is objectionable.

Wherever they do occur in houses, an insecticide should be applied along baseboards, drainpipes, and under the edges of carpets and rugs. Do not treat furniture or floor areas where children or pets come into contact with the insecticide. Use only a residual household spray containing one of the following chemicals: diazinon (Basudin[®]); malathion; propoxur (Baygon[®]); or chlorpyrifos (Dursban[®]). (R indicates registered trade names.)

For control out-of-doors, bury shallow containers to their rims in the soil (aluminium pie plates, sardine cans, etc.) and fill them partly with soil and add oil. This will trap many of the insects. Fish oil is best as earwigs are very strongly attracted to it. A bait

of dry bran (5 kg), fish oil (1 L) and 1% propoxur (500 ml) is very effective. Apply once a month around foundations, in flower beds, along hedges or fences, and in crotches of trees. Keep bait away from children and pets. Do not spread bait where chil-

dren play.

As consolation, the population of earwigs in any area stabilizes at a rather low level in time. Earwigs will probably not cause problems in the Montreal area after another 10 to 15 years.

Wasps, Hornets, and Bees

These insects are beneficial due to the plant pollination they bring about while gathering nectar and pollen from flowers. They also use many other insects as food. They build their nests in, on, or near buildings, and they tend to sting with very little provocation. Honey bees, on the other hand, sting only when they have something to protect. A honey bee can sting only once; then it dies. The sting is barbed and remains in the flesh of the person who is stung. The sting should be removed by scrapping it sideways with a fingernail. If it is left in place, repeated small amounts of venom will be pumped into the flesh. Wasps and hornets have smooth stings, and a single one can sting several times in rapid succession.

Honey bees form permanent colonies and spend the winters as colonies in a rather inactive state. The cycle of wasps, hornets, and bumble bees is quite different as they do not form permanent colonies. In August each colony produces queens and males. The new queens are mated and do not return to the nest. The male soon dies. Queens search for a protected place to spend the winter, in holes in the ground, under loose tree bark, or even in attics if they can find their way inside. The old colonies do not survive long after the frosty days of September and October. Old nests are not used in the following season. Each overwintered wasp or hornet queen builds a few paper cells in a suitable location; some species in exposed places under eaves or steps while others nest in holes in the ground, stone piles, etc. Bumble bees almost always nest in holes in the ground. The queen lays eggs in the cells and provides food for the larvae when the eggs hatch. When she has produced some workers, which are smaller than queens, the workers

continue building and food-gathering while the queen remains in the nest laying eggs. The nests are quite small at first but are expanded rapidly as the population increases. Most people do not notice them until midsummer.

Do not attempt to control any of these insects during the day while they are flying. Wait until dusk and when outside activity has ceased. Then locate exactly the entrance to the nest. If it is a hanging paper nest, the entrance will be on the bottom. The easiest insecticides to use are those prepared in aerosol form and which are available at most hardware stores. Use one which contains at least 0.5% propoxur (Baygon[®]). (R indicates the registered trade name.) These pressurized containers throw a thin stream, rather than a spray, and enable users to direct the chemical into the nest entrance from a distance of several feet. One application is usually enough, but if insects are seen entering or leaving the nest several days later, the treatment should be repeated. When all activity has ceased, the nests can be destroyed.

If you have a colony of honey bees in the wall of your house and have decided that they must be removed (often such colonies persist for years without causing trouble), contact a local beekeeper. Do not try to remove them without expert advice. Blocking the entrance may force the bees to find places where they can enter rooms in the house. Also, once a colony is dead, the bees and brood will decay, causing a very unpleasant odour. The wax combs of honey bees will melt if overheated and honey and wax can run down and cause discoloration of walls and ceilings. Most beekeepers know how to deal properly with the situation.

newsmakers

off campus

LOUISE CARSON, B.Sc. (Agr.), has recently accepted the position of Job Opportunities Coordinator and Information Officer for the Vintners Association in Sherbrooke, Que.

CELYNE FRENETTE, B.Sc. (F.), '81 is a food consultant for the Food Advisory Division, Agriculture Canada, Ottawa.

QUQUES GOULET, Ph.D. '74, was recently appointed to the position of Scientific Director of Lallemand, Inc., Montreal.

CE KHATCHIKIAN, B.Sc. (F.Sc.) is a purchasing agent for Wendy's Restaurants of Canada in Montreal.

MERAN MIRZA, B.Sc. (Agr.) '61, is currently manager for geotechnical services at Warnock Hersey Professional Services Ltd., in Mississauga, Ont., is the 1982-83 honorary treasurer of the Canadian Society for Civil Engineering.

QUQUES TREMBLAY, B.Sc. (Agr.) has been appointed to the position of Marketing Associate for Mensin Products of Elanco.

on campus

BRUCE DOWNEY, Department of Animal Science, spent three weeks in the People's Republic of China as a member of a two-man team working on a DA project which is looking at an artificial insemination unit.

HOWARD STEPPLER, Chairman of the Department of Plant Science, attended Board meetings of WAR (International Service for National Agricultural Research) in the Hague, The Netherlands, and a meeting of the Board of A.D.C. (International Agricultural Development Council) in New York.

CHARLES TANNER, Institute of Parasitology, gave three seminars on experimental hydatid infections and zoonosis at the Department of



L. Janette Taper

L. JANETTE TAPER, the daughter of Dr. C. D. Taper, now retired from the Department of Plant Science, is the co-author of a recently published book: S. J. Ritchey and L. Janette Taper, "Maternal and Child Nutrition," Harper & Row, 1983, \$19.50. The book covers topics ranging from physiology of pregnancy, fetal development, lactation, and growth from birth through adolescence to social and environmental factors related to the development of food habits. Included are topics such as nutrition and dental health, and teenage pregnancy. Nutritional findings are related to the physiological development of the entire human being — with a review of problems which may result from inappropriate nutrient intake. Janette obtained her B.Sc. and M.Sc. degrees from McGill concentrating in the area of Genetics. Her research for her M.Sc. thesis was carried out under the supervision of Professor W. F. Grant. Janette obtained her Ph.D. degree from Virginia Polytechnic Institute and State University, Blacksburg, Virginia, specializing in human nutrition and foods. After graduation she joined the staff at V.P.I. and is now an Associate Professor in the Department of Human Nutrition and Foods.

Biology, University of New Brunswick.

DR. F. VAN DE VOORT, School of Food Science, attended CIFST mid-year board meetings in Ottawa, Ont.

DR. S.P. TOUCHBURN, Department of Animal Science, recently served on a FCAC Committee to evaluate Laval University's "Centre de Recherche en Nutrition."

DR. LEWIS FISCHER, Economics Department, gave a seminar at the Inter-University Centre for European Studies in Montreal. The subject of the presentation was: "Agriculture and Food Systems in Poland."

DR. PETER SCHUEPP, Chairman, Agricultural Chemistry & Physics Department, gave a presentation to the Land Resource Research Institute of Agriculture Canada in Ottawa, Ont. Dr. Schuepp has also been invited to serve a three-year term on the Agriculture and Forest Meteorology Committee of the American Meteorological Society.

DR. EUGENE MEEROVITCH, Institute of Parasitology, recently spent five weeks in the People's Republic of China. He lectured on parasitological topics for two weeks at the University of Xiamen (Amoy), and he visited Parasitology and Tropical Medicine Institutes in Shanghai and Beijing. The trip was arranged by the Ministry of Education. As Dr. Meerovitch was educated and brought up in China (B.Sc. from St. John's University in Shanghai, 1947), this trip held a special significance.

MARCEL J. COUTURE, Diploma Program, attended the Annual Farm Credit Corporation held at the Chateau de l'Aéroport in Mirabel, Quebec. Mr. Couture also was guest speaker at a farmer's meeting in Shawville, Quebec.

PROFESSORS R.A. MacLEOD, D.F. NIVEN, Microbiology Department, along with graduate student **TERRY O'REILLY** presented papers at the 83rd Annual Meeting of the American Society for Microbiology held in New Orleans, Louisiana.

PROFESSOR PIERRE JUTRAS, Agricultural Engineering Department, and **MR. RUDI DALLENBACH**, Director, Macdonald Farm, attended the National Dairy Housing Con-

ference in Madison, Wisconsin. Mr. Dallenbach was also recently made a Director of the Board of Management of the Canadian SPCA.

GORDON BEAULIEU, Macdonald Farm, attended the Annual Holstein Conference in Vancouver, as the representative from Quebec.

deceased

W.G. MACDOUGALL, B.S.A. '15, at Lennoxville, Que., on March 16, 1983.

MARGARET (GRUER) HOWITT, B.H.S. '35, at Montreal, Que. on January 15, 1983.

DR. CYRIL KAY JOHNS, M.Sc. '26, at Stittsville, Ont., on December 13, 1982.

GRACE M. (D'ALBENAS) SCOTT, B.H.S. '39 at Pembroke, Ont., on January 31, 1983.

DR. EARLE W. CRAMPTON, at Moodus, Connecticut, on April 20, 1983. A renowned nutritionist, Dr. Crampton was a member of the Macdonald staff for 51 years. Contributions in his memory may be made to: Earle W. Crampton Award Fund, Department of Animal Science, Macdonald College, 21,111 Lakeshore Rd., Ste. Anne de Bellevue, Que. H9X 1C0.

JOSEPHINE SMITH in Bermuda on February 12, 1983. Miss Smith was the Administrative Secretary at the Institute of Parasitology for 38 years until her retirement in 1970.

MRS. MARIE CALLAGHAN HARNEY, on January 12, 1983, at Guelph, Ont. Mrs. Harney was Food Supervisor at Glenaladale and Assistant in the School of Household Science from 1957 to 1959, and Dining Room Manager at Glenaladale from 1959 until her retirement in 1965.

WALTER EDWARD WHITEHEAD (1891-1982)

Walter E. Whitehead, former professor of entomology at Macdonald College, McGill University, died in late December, 1982, aged 91 years.

Mr. Whitehead was born in Harrow, England, on June 29, 1891. He was employed by the province of Nova Scotia for a number of years as assistant in entomology, where he worked mainly for Dr. W.H. Brittain. Dr. Brittain came to Macdonald College in 1925 and Whitehead followed

him in 1926. Mr. Whitehead obtained the B.S.A. degree in 1930 and the M.Sc. in 1931, in entomology, both from McGill University. Promotion was slow in those days but he was made Assistant Professor in 1948.

Many Macdonald graduates remember Mr. Whitehead as a kindly gentleman who was exacting in his requirements from students. His own work was meticulous, and he expected all students to do their best. A mere passing grade was never good enough. He wrote a number of scientific papers and is remembered especially for his talents as artist, illustrator, and photographer. His illustrations appear in numerous papers of other authors, especially those of W.H. Brittain. (The Lyman Entomological Museum and Research Laboratory has preserved a number of his original illustrations.)

McGill University benefitted from his artistic talents. For many years he lettered the University degrees and diplomas in fine old-English script. The Macdonald books of remembrance of World War I & II were also his work. As well, he lettered the

McGill "*Book of Remembrance*," including the title page and the coat of arms.

Mr. Whitehead retired in 1956 and established his home in Round Hill, Annapolis County, Nova Scotia. Gardening was a favourite hobby, and he delighted in raising prize roses. He was active in community affairs, especially those with horticultural aspects. Possibly his last entomological effort was the designing of the crest for the Acadian Entomological Society.

Although his health declined in his later years, he remained active and still displayed much of his earlier activity and enthusiasm when I last saw him at his home in August, 1982.

Mr. and Mrs. Whitehead were married in October, 1917, enjoyed 60 years of happy marriage. Mrs. Whitehead, whose health is rather poor, continues to live in their Nova Scotia home.

V.R. Vickery

Curator, Lyman Entomological Museum & Research Laboratory & Professor of Entomology

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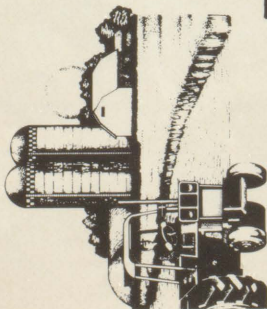
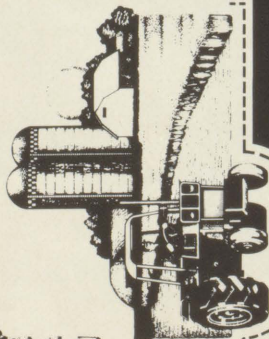
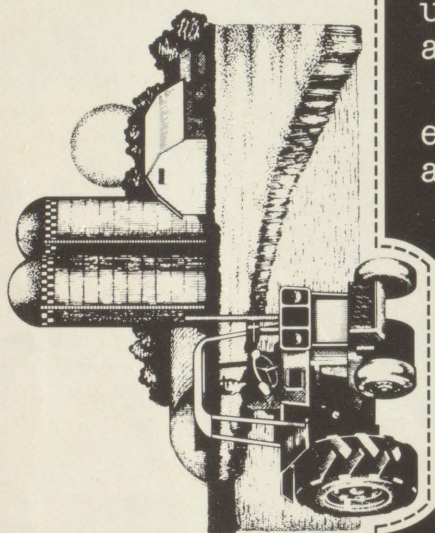
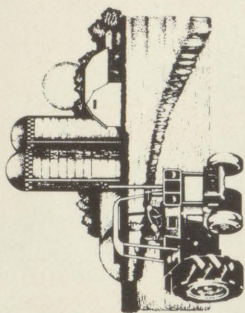
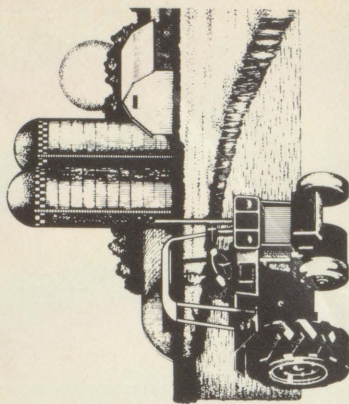
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